June, 1950

LIPPINCOTT LIBRARY
JUN 26 1950

EDISON ELECTRIC INSTITUTE BULLETIN

	Page
Seventh Semi-Annual Electric Power Survey Estimates Attainment of Fifteen Per Cent Reserve Margin for 1950—One Year Ahead of Schedule	185
Thomas Edison Memorial Mural Presented to State by Ohio Electric Companies	186
Making Our Own Tomorrow — GEORGE S. ARNOLD	187
Training Employees to Meet the Customer — C. J. BERNER	190
Industrial Power Sales Training and Supervision — C. T. SHOCH	193
Some Current Collection Practices and Their Effect on Customer Relations — H. S. HAHN and F. J. FLOM	201
Determining When to Buy — J. D. HOGG	205
Orchids for Mr. Ryan — CAL LYON	208
New Combined Boiler-Turbine-Generator Control Board for Centralized Control of Steam Electric Stations — H. L. LOWE	209
Electrical Equipment Committee Meeting — B. VAN NESS, JR.	212
Transmission and Distribution Committee Meeting — J. E. McCORMACK	212
Personals	214
Conventions and Meetings	216

PUBLISHED MONTHLY BY EDISON ELECTRIC INSTITUTE

ELECTRICAL RESEARCH STATISTICS
THE ELECTRIC LIGHT AND POWER INDUSTRY

Current Statistical Data Covering 100 Per Cent of Industry

March, 1949-1950

SOURCE AND DISPOSAL OF ENERGY—MONTH OF MARCH

	1950	1949	%
GENERATION* (Net)			
By Fuel Burning Plants	18,267,973,000	16,584,948,000	+10.1
By Water Power Plants	8,729,061,000	8,136,299,000	+ 7.3
Total Generation	**26,997,034,000**	**24,721,247,000**	**+ 9.2**
Add—Net Imports Over International Boundaries	107,500,000	113,000,000	− 4.9
Less—Company Use	132,581,000	131,750,000	+ 0.6
Less—Energy Used by Producer	557,863,000	365,135,000	+52.8
Net Energy for Distribution	**26,414,090.000**	**24,337,362,000**	**+ 8.5**
Losses and Unaccounted for	3,849,572,000	3,443,999,000	+11.8
Sales to Ultimate Customers	**22,564,518,000**	**20,893,363,000**	**+ 8.0**

CLASSIFICATION OF SALES

NUMBER OF CUSTOMERS—As of March 31st			
Residential or Domestic	36,013,124	33,966,638	+ 6.0
Rural (Distinct Rural Rates)	1,549,420	1,692,944	− 8.5†
Commercial or Industrial:			
Small Light and Power	5,349,415	5,144,937	+ 4.0
Large Light and Power	227,224	226,822	+ 0.2
Other Customers	150,005	143,101	+ 4.8
Total Ultimate Customers	**43,289,188**	**41,174,442**	**+ 5.1**
KILOWATTHOUR SALES—During Month of March			
Residential or Domestic	5,782,035,000	5,003,934,000	+15.5
Rural (Distinct Rural Rates)	492,970,000	465,416,000	+ 5.9
Commercial or Industrial:			
Small Light & Power	4,001,897,000	3,707,478,000	+ 7.9
Large Light & Power	10,830,013,000	10,320,378,000	+ 4.9
Street and Highway Lighting	249,630,000	228,923,000	+ 9.0
Other Public Authorities	595,928,000	536,062,000	+11.2
Railways and Railroads:			
Street and Interurban Railways	324,452,000	352,113,000	− 7.9
Electrified Steam Railroads	230,847,000	227,379,000	+ 1.5
Interdepartmental	56,746,000	51,680,000	+ 9.8
Total to Ultimate Customers	**22,564,518,000**	**20,893,363,000**	**+ 8.0**
Revenue from Ultimate Customers	**$414,263,200**	**$382,028,100**	**+ 8.4**

RESIDENTIAL OR DOMESTIC SERVICE

AVERAGE CUSTOMER DATA—For 12 months ended March 31st			
Kilowatthours per Customer	1,727	1,597	+ 8.1
Average Annual Bill	$50.60	$47.75	+ 6.0
Revenue per Kilowatthour	2.93¢	2.99¢	− 2.0

* By Courtesy of the Federal Power Commission.
† Negative Percentage due to Reclassification.

Vol. 18, No. 6, EDISON ELECTRIC INSTITUTE BULLETIN; published monthly. Entered as second-class matter Aug. 17, 1933, at the post office at Philadelphia 2, Pa., under the act of March 3, 1879. Publication office, 56th and Chestnut Sts., Philadelphia 39, Pa. Editorial office 420 Lexington Ave., New York 17, N. Y. Subscription rate $2.00 per year in the United States; $3.00 per year in foreign countries

The Edison Electric Institute does not assume responsibility for, nor necessarily endorse or approve, statements made by contributors to the BULLETIN.

EDISON ELECTRIC INSTITUTE BULLETIN

Volume 18 JUNE, 1950 No. 6

Seventh Semi-Annual Electric Power Survey Estimates Attainment of Fifteen Per Cent Reserve Margin for 1950—One Year Ahead of Schedule

Forecast 15.6 Reserve for 1950; 18.6 by 1953 — Delivery Time of Heavy Generating Equipment Reduced to Two Years — 83 Million Kw Capability Seen by 1953

A FULL year ahead of schedule, we have reached our goal of an average of 15 per cent reserves of power production capability in the United States," Elmer L. Lindseth, President of the Edison Electric Institute, observed in announcing results of the 7th Semi-Annual Power Survey completed last month by the Institute's Electric Power Survey Committee. New construction in progress will maintain and bolster these reserves, he added.

Earlier surveys of the Committee indicated that the average reserve generating capacity for the country as a whole would reach 15 per cent in 1951. The seventh survey shows a margin of 9,117,000 kw, or 15.6 per cent, for 1950, one year earlier than anticipated.

14.2% Reserve Margin in '49

The actual margin of reserves in 1949 was 7,664,000 kw, or 14.2 per cent, the survey showed.

Only in two major areas and some localized areas will the estimated reserve figure for 1950 be below the 15 per cent mark—in the Pacific Northwest where a margin of 5.9 per cent under median hydro conditions is anticipated and in the Southeast where a figure of 8.2 per cent is expected. Only in the Northwest in case of drought is there any likelihood of a power deficiency requiring load curtailment. The present water conditions in that area are far above normal.

Briefly the survey shows for the U. S. the following percentage margins between generating capability and peak load demands:

	Per cent
1948	6.6 actual data
1949	14.2 " "
1950	15.6 forecast
1951	18.9 "
1952	19.1 "
1953	18.6 "

Delivery Time Reduced

Delivery time of heavy generating equipment has been reduced to two years, and if the need arises additional generating capacity can still be added in 1952 and 1953. Undoubtedly more will be added in 1953.

On V-J Day the total power producing capability of the industry in the U. S. amounted to 50 million kw. This capability at the end of 1950 will be 67½ million kw. With the expansion program of the industry still in high gear, capability will reach 83 million kw in 1953, approximately a two-thirds increase in 8 years. The electric utility companies in this period will have added 28 million kw of the 33 million kw of additional generating capacity, or 85 per cent of the total added.

Although the 1950 margins of reserves are only about one-half the prewar margins, that does not mean they are not generally adequate. There are three sound reasons for this difference. First, the substantial increase in interconnection and power pool operations during and since the war, covering as it now does most of the populous areas of the country, has made unnecessary the amount of reserves formerly required. The second reason is the great amount of new high efficiency, high load factor, equipment that has been installed, which requires less reserves. Thirdly, prior to World War II employment was not at the high level now being experienced, which resulted in an abnormal high percentage of idle generating capacity for lack of power demand.

Preparedness for War Emergency

In considering the question of adequacy of electric power in the event of another war, it should be recognized that already we have added 50 per cent of new generating capability since the outbreak of World War II. If World War III were to come now, factories would go on two and three shifts per day, seven days a week, and they would switch from the production of civilian to war-time supplies. New generating capability could be built and interconnecting transmission lines constructed substantially as fast as the average new munitions plant could be built and put into full operation. Limitations due to shortages of materials, manpower, and transportation for war production would again control, as in World War II, before the supply of electric power would become a critical factor.

Thomas Edison Memorial Mural Presented to State By Ohio Electric Companies

A MAGNIFICENT and fitting memorial to Thomas Alva Edison was unveiled in the Ohio State Capitol in Columbus, Ohio, May 16: A massive mural depicting the life and accomplishments of Ohio's most notable son, executed by his friend, the celebrated artist, Howard Chandler Christy, and presented as a gift to the state by the electric power companies of Ohio.

Governor Frank Lausche, standing before the 8 by 14 foot mural, "Dawn of New Light," which hangs just outside the Governor's office in the statehouse, accepted for the state.

Walter C. Beckjord, President of the Cincinnati Gas & Electric Co., made the presentation on behalf of the privately owned utility companies of the state. Mrs. Beckjord pulled the cord to unveil the painting.

Among others present at the unveiling were: Mrs. John E. Sloane, Edison's daughter; Elmer L. Lindseth, President, The Cleveland Electric Illuminating Co.; John Poston, President, Columbus and Southern Ohio Electric Co.; Kenneth Long, President, Dayton Power and Light Co.; members of the Ohio Public Utilities Commission, Harold L. Mason, Chairman, Harry M. Miller and R. Martin; and R. Ferger, Publisher of the *Cincinnati Enquirer*.

Mr. Beckjord called the painting "an inspiring example of what one man's idealism and inventive genius can do. Thomas A. Edison created the great utilities industry."

Addressing himself to Mrs. John E Sloane, West Orange, N. J., daughte of Edison, the inventive genius who wa born at Milan, Ohio, in 1847, the Gov ernor asked her to hear his thanks o behalf of her late father: "Thanks t you, Thomas Edison, for what you hav done for mankind. We are proud to hav your portrait in this capitol."

Mr. Christy, a native of McConnells ville, Ohio, declared: "It takes mor than one painter to make this possible It also takes a group of men like thos in the public utilities."

Utility companies other than thos named which shared in expense of th painting were Ohio Edison Co., Centra Light and Power Co., and the Toled Edison Co.

Making Our Own Tomorrow

By George S. Arnold

Budget Analyst, Public Service Company of Indiana, Inc.

An address before the Young Men's Utility Conference, Indianapolis, Ind., April 19, 1950

IN approaching a subject of this nature, let us first resolve it into two parts:

1. What kind of a "Tomorrow" do we want to make, and
2. What are the elements we must consider in going about building this "Tomorrow."

If a group of people were asked to give their individual definitions of a successful man, each would undoubtedly start with a different concept of just what success is. Certainly there are thousands of different definitions to be found in books, magazine articles, leaflets, and so forth. Permit me to suggest here a definition probably not found in any book because it's purely my own conception of a successful man. You may not agree with me, but at least, it may provoke some thinking on the subject and cause you to arrive at a definition suitable to your own philosophy. Here it is:

What Is a Successful Man?

A successful man is a man who has achieved that position which establishes the maximum degree of balance at the highest level between these three factors:

1. Job satisfaction
2. Widest use of abilities and skills
3. Greatest amount of service to the employer or firm

Or, it might be rephrased this way: A successful man is a man who is the happiest in his job, using his talents to their greatest extent in performing the largest service for the company.

The Ultimate Determinant

Let me repeat at this point that there are as many concepts of success as there are people seeking success. In the final analysis, our own scale of values is the ultimate determinant of the kind of success we enjoy. Unless we can see in our jobs or careers a meaning or value which will give our very lives a purpose and direction, a reason for living, if you please, we cannot hope to attain to success in its ultimate.

Our jobs must mean vastly more to us than purely a means of livelihood, an unfortunate necessity in order that the rent may be paid. The matter of monetary reward has been purposely omitted from this definition because, while it may be most naive to say this, I have yet to be convinced that success may be measured in terms of how much money one can get for his skill or ability.

Consider All Factors

In considering this definition, it might be pointed out that all three factors are really completely interdependent and failure to consider one in favor of the other two can only lead to failure, or at best, limited success. For instance, a person who is dissatisfied in his job not only fails to render the maximum of service to his employer, but also cannot possibly be using all of his abilities to their fullest. Conversely, when one fails to give to his utmost in service, he will be dissatisfied in knowing that there is more he can give if only he were permitted to perform more duties he knows he is capable of.

Another consideration that should be mentioned is this. Each one of us has his limitations, both physical and mental, and they must be recognized. I am reminded of a rather terse but pungent quotation generally attributed to Socrates, which says "Know Thyself." It is not an easy task to make an accurate and objective analysis of one's limitations because all too often we find tasks we think we cannot do but, if required to perform them, find to our surprise that we were more capable than we thought we were.

Also, we may approach a job with every confidence only to find that it is beyond our particular capabilities. I don't believe we ever know fully and accurately just what our capabilities are; all we can do is try continually to find out. In general, however, we can do a passable job of self-examination.

Having determined the kind of a tomorrow we want to make for ourselves and recognized to some degree our limitations, let us proceed to the next step, which is, discovering what types of work will realize for us as individuals the greatest job satisfaction, greatest use of abilities and skills and therefore enable us to perform our maximum service.

Aptitude Testing

One step in this direction is that of aptitude testing which, while by no means infallible, may serve as an *indication* of the direction one's efforts should take to have the greatest *probability* of success. The value of such tests has been demonstrated so markedly that many large companies now incorporate them in their personnel program. Such privately conducted tests, however, are generally somewhat limited in scope to the particular operations of the company and therefore tend to give the employer rather extensive knowledge of the aptitude of the prospective employee, but only insofar as the needs of the company extend. The person being tested, therefore, might not get as complete a picture of his aptitudes as he might desire, particularly if they embraced fields foreign to the company's operations.

Tests by Public Agencies

A second and understandably more popular examination is that conducted by public agencies, notably the public schools. This is conducted free of charge and is available to the public in almost all larger communities. Such tests are usually scheduled over several sittings of from two to four hours each. After completion, a trained analyst reviews the results and in a personal interview advises the examinee of his findings and counsels with him regarding the major job classifications for which he appears to be suited. The examination usually consists of five parts, namely, Vocabulary, Mental Ability or Intelligence, Mechanical Aptitude, Preferences, and

Temperament. The individual who makes the effort of taking an aptitude test will at the very least confirm what he may already know about himself and, in all probability will discover some traits and innate abilities of which he has been unaware and which may prove valuable to him in planning his career.

Potential Lines of Promotion

Having determined to our own satisfaction what general direction our interests and abilities indicate we should take, it would seem logical to analyze the potential lines of promotion which would lead us toward our particular goal. An individual just getting started in his chosen career and fresh from school and formal training, will naturally find it wise to take advantage of every opportunity to become as fully acquainted as possible with every department of his firm as is possible.

For instance a new clerk in the accounting department should not reject an opportunity to gain some experience in the engineering department merely because he wants one day to become comptroller and feels that engineering experience is unnecessary. Neither should an engineer turn his head on an opportunity to work in the sales department because he has no aspirations to become sales manager. In the lower job levels, every opportunity to gain the widest possible experience should be seized upon in the certain knowledge that no experience gained in any phase of a company's operations can under any circumstances be considered valueless.

The Need for Wider Experience

The wider one's experience and knowledge of his firm's operations, the more valuable he is to that company and the more likely he is to be promoted ahead of others lacking his wide experience. A man who has a sound working knowledge of many departments and is able to correlate their activities in his own mind is much more valuable than one who knows every detail of his own job but is woefully ignorant of other departments and the part his work plays in the overall operation of the company.

It is only when we have completed our apprenticeship, so to speak, that we need to give more careful and concerted study to specific lines of promotion. Upon reaching that stage, one should give serious consideration to definite areas in which he sees his future to lie. In other words, a goal should be set out in his own mind and he should attempt to determine the job progression which will lead to that goal.

Quite obviously, one may not predict with absolute certainty exactly what positions one will hold before realizing that goal any more than the captain of a ship knows to each second of latitude and longitude the course his ship will travel in going from New York to Liverpool. The important thing is to fortify oneself with as much knowledge and experience as possible concerning all the tasks that may be required of one along the way with full consideration being given to every possible path that may be taken in getting there.

The Crux of the Problem

Now, we come to the crux of the entire problem, and truly, it is the most difficult question of all. Just what is the formula for promotion? Assuming all the things just discussed have been done, where do we go from here? It goes without saying that there is no cut and dried formula or procedure which, if followed to the letter, will automatically produce success. Of course, there have been volumes written on this subject by men eminently more qualified than I am to point ways and means of advancing oneself in his chosen career.

However, since my purpose here is to attempt to give you some of the thinking that men like ourselves, most of whom are standing only on the lower rungs of the ladder, are doing on this vast subject and not to bring you the usual platitudes that we are all familiar with, let me state that the approach used is based on purely personal observation and ideas which have come to me through experience and research and which seem to merit our consideration. This is not to say that we can discount the tremendously important part such commonly repeated qualities as initiative, ambition, perseverance, study, aggressiveness, loyalty and a host of others play in the development of one's career. Rather let us assume that we are at least aware of these qualities and go to some perhaps not so familiar and maybe even controversial aspects of the problem.

In lieu of a success formula, may I suggest this promise as a starting point and one upon which we can all agree. Each day of our lives, we are inevitably building up a reputation, either good or bad, among our superiors and co-workers. And to put it very simply, if this reputation is good, our chances of promotion when an opening is available are excellent. If this reputation is not good, we will either stay in our present job and unless we mend our ways, stay there indefinitely, or have it tactfully suggested that we might be happier with another connection. It's as simple as all that.

Why People Don't Get On

Let's take a look for a moment at some very interesting and revealing figures on why people *don't* get on in business. In a survey conducted by H. C. Hunt, Principal of the high school in Meriden, Conn., the office and clerical help of 76 corporations was studied to find out the more common deficiencies which prevented promotion. Of all the reasons why employees failed to be promoted in these firms, only 24 per cent were reasons involving lack of specific skill, the highest in this group being, of all things, lack of knowledge in the use of the English language, 5 per cent. Only one person in ten was *discharged* for lack of skill or proficiency in his job. On the other hand, 76 per cent failed to be promoted because of bad or unfavorable character traits. And nine out of ten were discharged for this reason. Those deficiencies occurring most often in order of their occurrence were Lack of Initiative, Lack of Ambition, Carelessness, Non-Cooperation and Laziness.

Whose Fault?

One important and encouraging observation to be gained from these figures is just this: Of all the employees who failed to be promoted, three-fourths of them failed for reasons wholly within their own control. These individuals, in other words, could not say, "We lost out because I didn't have enough formal training for the job," or "I never was good at figures anyway" or "it's not really my fault Joe got the job instead of me."

Some of you may not agree with this conclusion and, justifiably so, on the basis that consideration is not given to environmental factors which necessarily play a part in character development

Be that as it may, grant me, if you will, that you and I do exercise a considerable amount of control over our destinies by the choices we make which influence our character development.

Let us go back for a moment to the matter of skill and ability. While deficiencies may exist in the tools we have to work with, namely our inherent or acquired abilities and skills, even these can be developed both on and off the job. Schooling and technical training may be passed over here as being self-evident. Not so evident is the fact that by taking to work with us a deep curiosity concerning the things that go on around about us and using every opportunity that presents itself to actually do as many different tasks, regardless of how inconsequential or menial they may seem at the time, and finding out why they must be done and why in such and such a manner, we must inevitably develop our abilities to a considerable degree.

A Vital Attribute

One of the attributes an individual must possess in order to progress is a facility for grasping quickly and thoroughly the requirements of a given task and the accomplishment of that task with a minimum of instruction and follow-up. This facility is acquired only by exposing oneself to as many different operations as possible and learning all one can while doing the job.

The development of desirable character traits, however, is not so easily accomplished. In the first place, that man is rare indeed who will admit to himself such undesirable characteristics as non-cooperation, laziness or even lack of ambition or initiative. Hence, he will have to be honest with himself in the extreme to be able to detect such deficiencies. Neither can he rely altogether upon the opinion of others for fear that under certain circumstances he may be misjudged either through a desire on the part of his critic to spare his feelings or because the critic may be judging him under the strain of emotions such as anger or displeasure.

Development Starts in the Cradle

In the second place, character development starts in the cradle and continues, either for better or for worse, through each day we live. Consequently, by the time we reach our present maturity, the mold has been pretty well cast. Reshaping it may be accomplished only at a high price.

And Continues to the Grave

However, in the further knowledge that building of character continues even to the grave really lies our only hope in tackling the problem. That is, knowing that each decision made or avoided, which as a moral consideration involved, works for the building or tearing down of character, we must recognize that only as we use wise and moral judgment in making such decisions will character be developed. To cite an example of such decisions, may I suggest an instance where a report must be compiled, we'll say by an accounting clerk. There may be two ways of gathering the information for the report, one involving considerable work but insuring absolute accuracy and another involving the forcing of certain figures and accomplishing the job in a short time. The result may actually be the same in either case, but by using the latter method, the possibility of error is multiplied many times with little or no probability of detection until it's too late. Should the clerk choose the latter method, he necessarily weakens himself morally, even though to an imperceptible degree.

The next time, it will be even easier to choose the way involving less work and consequently less accuracy and sooner or later, it will catch up with him. Oh, we might mention countless instances involving moral decisions, such as making out a time ticket reporting hours worked. How easy it is to add an extra 15 minutes. Or maybe telling a little white lie will relieve us of assuming responsibility for an error we know we made. Individually, maybe they seem to amount to nothing at all, but collectively they all add up to the building or destroying of character. It's amazing how fertile our minds are when it comes to rationalizing some little deviation from what we know is right. Some of the reasons are positively ingenious.

We may be assisted in discovering our deficiencies in character traits by the aid of a second person, but only to the degree that that person's regard for our own welfare transcends considerations he may have for our own personal feelings and provided he is willing to risk the possibility of a broken friendship. In other words, only those who are close to us personally or whose opinion and judgment we trust implicitly, are capable of assisting materially in such matters. To be judged by less would have the effect of discrediting in our own mind the opinion offered. In general, it might be said that the problem is laid pretty much on our own laps to solve to the best of our respective abilities.

Extra-Curricular Activities

Closely related to the development of favorable character traits and ofttimes directly responsible for their development are the activities one engages in outside of the office, extracurricular activities, so to speak. Such activities fall generally into two categories: first, business and professional groups, such as Accounting or Engineering societies, and civic groups, such as Junior Chambers of Commerce, Rotary, Lions, Kiwanis and Exchange clubs, and secondly, church and social groups such as fraternal organizations.

Active participation in such organizations may be invaluable not only from the standpoint of improvement and development of leadership and organizational abilities, but also associating with people in whom one sees such admirable qualities of character that he is inspired unconsciously to emulate them. Such activities have the tendency of broadening one's horizons to the end that his life is made much richer by the experiences and contacts he enjoys.

A Common Pitfall

Active participation in these organizations, unfortunately, comes not without a price and sometimes unfavorable consequences. It is a common pitfall to become too much a "Joiner" and consequently find oneself unable to participate fully or derive the utmost in benefit from such organizations. You become a member of many groups, but active in none. And, too, it frequently happens that too much activity in several groups lessens the energy and enthusiasm you must bring to your job and sometimes even causes one to devote too much time to club activity and too little time to the responsibilities placed on one by the employer.

However, by using common sense in budgeting time and energy and by taking on no more outside activities than can be worked into a sensible living

(*Continued on page* 200)

Training Employees to Meet the Customer

By C. J. Berner
Wisconsin Electric Power Company

An address before the National Conference of Electric and Gas Utility Accountants, Louisville, Ky., April 17-19, 1950

A REPORT on the "Technique of Interviewing Customers" by Mr. Walter Frick of The East Ohio Gas Company and Mr. Henry Flanegan of the Philadelphia Electric Company, presented at Atlantic City in 1948, is the basis and inspiration for the work of the Customer Relations Committee. The discussions resulting from the Frick-Flanegan report lead to two interesting questions, namely: what is being done by the gas and electric industry to instruct employees who meet the customers in the proper methods of approach, and what material has been developed and is available for training of this kind? The AGA-EEI Customer Relations Committees decided to get the answers to these questions.

The McMillen Committee Report

This decision was followed by the appointment of a committee with Mr. Beach J. McMillen of The Cincinnati Gas and Electric Company as chairman, for further research of these two questions. In its report with the interrogative title, "Are We Training Employees to Meet the Public?", presented at the AGA Chicago Convention in October 1949, Mr. McMillen's committee answered many of the questions that this subject had aroused, and it opened a wide area for further investigation and study. The data that were accumulated by the committee and which were made a part of its report, fairly shouted that more information and help were needed if an adequate job was to be done in training the employee in the proper approach to the customer.

The McMillen committee had sent questionnaires to 75 member companies and sixty-five responses had been received. This in itself was indicative of the keen interest in the subject. Thirty-one, or better than 47 per cent of the companies, reported that they had no training outlines, guides, manuals or material of any kind for training purposes on this subject. Forty-nine per cent made no effort to coordinate between departments what material they did have, or the methods used in training employees in their approach to customers, so as to assure a uniform coverage and a standard of results.

A large number of the companies seemed to rely largely on "on-the-job" training to embrace all phases including customer relations. There is nothing wrong with this type of training. It has a very important place in any training program, but it is not sufficient for a well-rounded program for training in the fundamentals of employee approach to customers. It normally cannot properly stress the importance of creating and sustaining good customer relations.

Checks on Training Results

More than half of the companies which give some training of this type report that no systematic check is made of the performance of the employees in meeting the customer to determine the effectiveness of the training or to learn how and to what extent the principles outlined in the training course are put into actual practice.

Development of Material

With the aforementioned facts as a background, the Customer Relations Committees of our two Associations realized that it was to the interest of the industry that the development of material for this specific type of training be undertaken. The committee recognized also the volume of work that would be involved in any attempt to develop overall aids to meet the individual needs of member companies in their endeavor to develop and promote training plans of this kind. For this reason, it was decided to extend the work of the committees of the two preceding years into the current year for the purpose of developing definite material for use in actual training. Because the training falls into two separate areas, the work of development was assigned to two project subcommittees. One headed by Mr. William E. Brokaw of Public Service Electric & Gas Company, Paterson, N. J., was assigned the task of planning and developing a manual or guidebook; the other subcommittee with Mr. Fred J. Porter, Jr., of Consolidated Edison Company of New York, Inc., as chairman, was appointed to concentrate on training by films.

These two subcommittees have accomplished much with their individual projects, but their objectives as had been anticipated, because of their broad scope and comprehensive nature have not yet been reached. This report therefore is presented to outline briefly the progress made thus far and the objectives toward which each is directing its efforts.

Project for the Preparation of a Guidebook to Better Customer Relations

The committee has not endeavored to expound any new theories on customer relations but rather, its purpose has been solely to devise a fresh approach to this all-important problem.

When the guidebook is completed for presentation to the industry, the committee proposes that it contain the following:

A Foreword directed to the employee stressing the latest thoughts on the increasing importance of good customer relations and the vital part that he has in building and sustaining these relations.

A Guide for Instructors, with suggestions for formulating well-rounded training programs, and outlining methods for the practical application of the subject matter.

The best material available pertaining to the technique and fundamentals for promoting good customer relations as they apply to the four major approaches that the employee has to the customer:

1. In the office
2. In the field
3. By telephone
4. By correspondence

These divisions will be further broken down to deal specifically with each type of job where necessary.

The guidebook will also contain a supplementary reference list of material on the subject available from sources outside of the gas and electric industry.

This brief outline suggests the scope of the guidebook and the objectives that

this subcommittee is endeavoring to attain.

The question might be raised at this point as to why the committee instead of producing a guidebook, does not attempt to compile a complete training manual that could be used verbatim by all companies in any of their departments. The committee realized that a manual of this type would be impractical for general use and adaptability because of the many complexities that would be encountered and the differences between companies in policies, operations and organization.

Uses for a Guidebook

On the other hand, the guidebook contemplated by this subcommittee will upon completion supply the industry with the groundwork and basic needs for any type of customer relations training program regardless of a company's size, location, organization or other individual requirements. It could be used in the preparation of material for individual guidance or for building a training course for the company personnel as a whole or for selected departments as a basis either for classroom instruction, lectures or discussion groups. One recent incident which came to the committee's attention is illustrative of the potential value of such a guidebook. A company wanted to prepare a card containing pertinent information of a certain phase of customer relations for distribution to a selected group of its employees. The individual to whom the job of preparing the card was assigned told the committee members that it was necessary to spend much time to accumulate sufficient information and material to complete this relatively simple assignment. He feels sure that the proposed guidebook of this committee would have been of considerable assistance and saved much time.

Customer Relations Accented

Another side-light on its possible use, is the intended compilation of the material so that the guidebook can be given to a trained department supervisor for formulation of a detailed intra-departmental manual for training and guidance of his particular group.

Of necessity, the guidebook will avoid the mechanics of the job, and deal primarily with customer relations; their fundamentals, application and effect. To do otherwise would make a work of this kind cumbersome, difficult for reference and would appreciably restrict the application of the material. The committee is proceeding on the premise that all employees are indoctrinated in the operations and policies of their company as another part of their company's training program, and that they have had complete job training.

You may be interested in knowing how this committee is approaching this assignment. While this report is somewhat brief and only in outline, you may have gleaned from the description of its objective, that the committee has set itself a job of wide scope with many complexities.

The McMillen committee of last year gathered considerable valuable material from companies that were solicited. This material has all been turned over to the current committee. Additional information and material has since been received from other companies. As a consequence, a wealth of material is in the committee's hands for study, tabulating, compiling and all the detail that goes into the work of building an "encyclopædia" on customer relations training.

This work is being accomplished by dividing the work and assigning it on an equitable basis to each of the twelve committee members for classifying, etc. When these details are completed, the results will be assembled, edited and compiled and made available to the industry for its use.

Project for Better Customer Relations Training by Films

This project subcommittee, assigned the task of studying the training of employees who meet the customers by the use of films, has approached this problem from two standpoints. First, a survey was made to find out what films are currently available and to present for your use a list of these with the necessary data to enable you to make selections from them. Second, a study has been made of the problems involved in the production of a film or films specially designed for the customer relations training of employees of the gas and electric industry.

The committee recognizes that it has been assigned a small section of a large problem. The training of employees in customer relations, aside from the mechanical details of job training, involves the use of numerous teaching techniques. We believe that films are one of several tools which may be used to accomplish this training. With the emphasis on visual education in this country today, there is an increasing demand for films for training purposes. We believe, however, that you should look upon our work as merely a part of the broad training problem and not an end in itself.

To accomplish its first objective, as to what films are presently available, the committee forwarded a questionnaire to 74 Association and Institute members asking for pertinent information about films used by them. Sixty-three companies replied, indicating a wide interest in the subject. Of these, 34 said flatly that they do not use films at present. The balance has used them at one time or another and in varying degrees.

Film Tabulation

Detailed information about the films which had been used was requested in the questionnaire. The following tabulation indicates the names of the films reported:

"By Jupiter"	8
Vocafilm Series	6
"Telephone Courtesy"	5
"You Can Tell by the Tellers"	3
"Double Horseshoes"	2
"The Compliment Club"	2
"Fundamentals of the Gas Industry"	2
Miscellaneous	7

An appendix to this report shows pertinent data as to the type and availability of the above films. The miscellaneous grouping includes a number of films which might be useful but before listing them in the appendix, we felt it necessary to obtain further data from their producers. In addition, there is a number of films available through the Bell Telephone Companies on which further information is needed.

Neglected Training Tool

It is significant to note that, except for "Fundamentals of the Gas Industry," which is not specifically directed at customer contact employees, none of these films was produced by or for the gas and electric industry. Although we have more widespread customer contact than most concerns, this tool for training our employees has been neglected. This may be due to a large extent to the cost and the production problems involved which was the second field explored by this committee.

In an effort to throw light on this part of the operation, the committee con-

sulted with a specialist on films of this type and with the officials of two concerns producing large numbers of films for school use. Estimates of costs vary quite widely, depending on the quality of the product desired. Further study of this subject is necessary before we will be prepared to present a specific proposal. The committee feels, however, that it is desirable to produce a quality production if it is to be used throughout the entire Industry for the training of its employees. Such a production, if properly prepared, might also have some value from a public relations standpoint for showing to community groups.

From our studies so far, including the comments of those who answered our questionnaire and the obvious interest in the Marshall Field and Company film, "By Jupiter," it appears that there is not only a definite need but also a demand for good films for training purposes. While the cost of production may appear high, it would seem from the apparent demand for training films, that the cost proportionately charged to the individual users would be quite reasonable to each and still be sufficient to cover the initial production cost. Furthermore, there is a distinct possibility that a properly developed film might be added to the library of a major producer in this field, making it available to other industries and to schools. Costs in this case would be greatly reduced.

Program for the Future

Your committee's program for the immediate future is as follows:

1. It is intended to try to expand the list of available films by turning to other industries, such as the airplane and oil industries and obtain such material as they may have available.
2. It is planned to continue to inquire further into costs and the problems of production, slanted particularly toward the gas and electric industry.

When the two project subcommittees were appointed at the beginning of the present Association and Institute year, it was anticipated that their objectives probably could not be reached within the current year. This probability became a certainty as the work advanced and the extent of research required became evident. As mentioned in the preceding review of the study made within the industry by these committees, there is an urgent need, if not an actual demand, for a training program of this kind. It has been a well recognized fact that at all times the customer's friendly attitude and his endorsement of our companies' relations with him are of prime importance to the progress of the industry. The committee submits that companies today cannot afford the risk of devoting insufficient attention to adequately training their employees in properly meeting the customer.

With these factors in mind, it is the conviction of the joint AGA-EEI Customer Relations Committee that the work of these subcommittees should be continued. It is therefore urgently recommended that it be continued to a logical conclusion so that the industry may derive the benefits of a program specifically devised to meet the industry's particular requirements for training its employees in meeting the customer.

Partial List of Films Available for Training Customer Contact Employees

"By Jupiter"—35-mm sound movie produced by Marshall Field and Company, Chicago, Illinois. Available at about $125 from Wilding Picture Productions, Inc., New York and Chicago. This film depicts one day in the life of Mr. Average Man (Poindexter in the film story) who, without thought of the effect on others, as well as himself, goes through many unsatisfactory experiences. He is given an opportunity to live this day again, but under the direction and guidance of the God Jupiter, who proves to him that by being "wisely selfish" he can develop an attitude toward others which pays rich dividends. Can be shown in 25 minutes.

Vocafilm Series—16-mm sound slide series produced by Voca Film Corporation of New York. Available at about $350 from the producer. Consists of six separate subjects, "Our Biggest Job," "What Is Public Opinion," "The Right Start," "Set the Pace," "Handling Complaints," "Don't Pass the Buck." There are trailers for each film, a booklet for the employee and a leader's guide to aid in discussion following its showing. Each subject takes about 15 minutes.

"Telephone Courtesy"—16-mm sound movie produced by the Bell Telephone System. Available on a loan basis from most local Telephone Companies. The story in this film is about the wrong and right way to use the telephone and the effect that a poor telephone voice and attitude will have on other individuals and on one's business. Takes about 2 minutes.

Films 15 to 20 Minutes Long

"You Can Tell by the Teller"—16-mm sound movie produced by the Bell Telephone System. Available on a loan basis from most local Telephone Companies. This film shows the right and wrong ways of accepting customer payments, receipting and making change. Although it emphasizes correct customer relations techniques, it is more applicable to Tellers and Cashiers than it is to other customer relations employees. Can be shown in about 20 minutes.

"Double Horseshoes"—16-mm sound slide film produced by the Dartnell Corporation, New York, and available from them for about $25. A human interest story of how one of the principal characters in the film learned to make friends and how it helped him to succeed. It places emphasis on doing a little more than is required and on showing consideration and cooperation. Takes about 15 minutes.

"The Compliment Club"—16-mm sound slide film produced by the Dartnell Corporation, New York, and available from them for about $75. Based on Dr. George W. Crane's famous "Compliment Club." Has an effective idea and appeal for the average customer contact employee because it shows how to improve contacts with the public, with customers and with fellow workers and how the employee can accomplish more and handle "difficult" people.

"Fundamentals of the Gas Industry"—35-mm sound slide film produced by American Gas Association and available from them. Consists of six films under the general headings of fuel, service and building the gas load. Some details of good customer relations in the Service Section. Running time is about 15 minutes per film.

A Catalog of
EEI Publications
is available upon
request to:

EDISON ELECTRIC INSTITUTE
420 Lexington Ave.
New York 17, N. Y.

Industrial Power Sales Training and Supervision

By C. T. Shoch

Manager, Industrial Sales Department, Pennsylvania Power & Light Company

An address before the 16th Annual EEI Sales Conference, Chicago, Ill., April 4, 1950

FRANKLY, it is difficult to know where to start a discussion which combines training and supervision. The subject quickly gets us to the end-less-belt stage, for just where training leaves off and supervision takes over is indefinite to say the least. My objective review of what our Company is doing in these matters leads to the definite conclusion that while we are training, we are supervising, and vice versa. Therefore, this discussion will incorporate both important functions as most of the points are developed.

The purposes and methods employed in the various phases of industrial power sales work would fill a book—literally; a book which you and I have written and reviewed in our minds many times as we have gone about the daily work of organizing and directing our industrial sales forces. This discussion can merely report some of the workings of what has been for us at least, a gradually developed system of industrial sales management.

Training Is Never-Ending

The training of our men—and with it the corresponding supervisory effort—is a never-ending job. Actually we begin training before a man is employed—encouraging and directing his thoughts throughout the period of application and interview; coaching him on the proper regard for sales work, for the Company and for the opportunity afforded through outstanding contribution to the industrial life of the community. This is important because we want men to like their work and the Company they work for. Training is intensified during employment and is carried on even after employment, as witness the case where our retired men are invited back to our meetings and conferences—concrete evidence to those still with us that we have a friendly interest in their continued self-development.

Personnel Selection by Patterned Interview

Fortunately we get an organized, detailed opportunity to explore the potentialities of our men before they are employed. This is the result of using a patterned interview procedure adapted for the whole sales department when we started rebuilding our sales forces immediately at the end of World War II. By the time the personal interview consisting of some 180 questions has been completed, a 1½ hour procedure at minimum, and the telephone checks on references have been made, the Company has a fair idea of the background and capabilities of the man to absorb training and develop his engineering and creative sales ability.

New and Older Men to Train

We have more than just new men to train and supervise, of course. Fully one-third of our field personnel are men who were held to industrial work throughout the war period. These older men are being used to the utmost in helping bring along the cubs. Everyone now in a training or supervisory capacity in the industrial sales department has come from the ranks, with adequate experience in "shepherding" groups of customers.

We are careful to keep all training and supervision on a practical, "do as I do—" plane. The older men instantly spot any insincerities, the younger men "catch on" very fast if they find *you* are not doing what they are being told to do.

We are training minds and actions to match competitively keen thinking and self-centered acts of others—much more difficult than training men simply to keep one step ahead of machine operations. Our goal is to have customers continually regard our men—"I like the way you look, I like the way you act, I like the way you tell your story."

The 8-Point Training Job

Our training and supervision are directed at the 8-point job we feel is necessary to develop leadership in our representatives, help them accomplish a well-rounded career, and produce a worthwhile manpower investment for our Company. These 8 points are:

1. Knowledge of the Company and the services it has to offer and enthusiasm in getting that information across to others.
2. Faith in the free-enterprise system and a willingness to promote it.
3. Practical, up-to-date information on potential uses for the Company's services—both by specific applications such as lighting, heating and so on, and by types of industries such as mining, steel and textile.
4. Full knowledge of the competition to be faced and of the ways of making inroads against it. This includes not only a hard-hitting campaign against the direct competition of prime movers and heating, but also the struggle to get a fair share of the customer's dollars that might otherwise go for purchases unrelated to his need for our services.
5. Knowledge of sales techniques and the developed skill in making presentations most effective.
6. Information on ways of improving customer and public relations and the friendly attitude necessary to promote them with sincerity.
7. Knowledge of ways of working effectively with sales allies—manufacturers, distributors, dealers and so on, and the will to carry them out.
8. Knowledge and desire to cooperate fully with other departments of the Company, including—and I feel this needs a bit of stress—working closely with the other units of the Sales Department.

Training Sources Available

Several training programs are available to us, as they are to most Utility Companies. These are listed according to the primary sponsoring agency:

Company-wide

Supervisors' Conference Program
Student Training Program

General Commercial Department

Basic Sales Training Courses and Refreshers
Lighting Clinics

Manufacturer-Distributor meetings

Industrial Sales Department

Industrial Sales Training Conferences

Utility Industry

Pennsylvania Electric Association-Industrial Sales Conferences

Interstate Power Club of New York meetings

Others

Technical and Professional Engineering Societies

Manufacturers' meetings and demonstrations

Community Industrial Exhibits

Pennsylvania State College Industrial Conference

College extension classes

Using the Training Sources

The foregoing 8-point training job will be dealt with in some detail to describe training methods which seem effective. Corresponding supervisory efforts will be mentioned as these points are developed, and explained. The first two points—"Knowledge of the Company" and "Faith in the free-enterprise system" are covered for the most part by Company-wide orientation and Supervisory Conference work and will be touched on briefly. The remaining 6 points, which are strictly of industrial sales concern, are the substance of our Industrial Sales Training Conferences, now in their 5th year. These will be highlighted as of greatest interest to industrial power salesmen.

First, Know the Company

Basic information as to the Company's properties and its services is made available to the new man at the time of orientation, and by plant visits as opportunities develop. This sort of information is sketched very briefly here for the double purpose of informing you of the conditions governing the training and supervision procedures effective in our particular case, and to exemplify the kinds of background material our men receive.

Pennsylvania Power & Light Co. operates in a 9500-sq mi area in Central Eastern Pennsylvania, a section generally thought of as highly industrialized, but containing also agricultural and recreational resources of the highest order. A large part of the terrain is rugged, being crossed by the broad backbone of the Appalachian Mountains, resulting in substantial distances between centers of population and requiring the separation of the Company's charter territory into 8 areas for commercial operation. These areas—known as Divisions—each have outstanding industrial activities of several kinds. Some have mining, for 60 per cent of the world's anthracite is produced in our territory. Some have large steel operations—notably Bethlehem. Others have cement, textile, food processing.

There are a total of more than 4200 industrial plants in the area with a connected load of 1¼ million hp, resulting in annual electric revenue to the Company of about $25 million.

General Office Staff and Functions

The industrial sales force caring for this three-eights of the Company's total business is organized into two groups—a general office staff with the responsibility for planning and promoting sales, keeping abreast of developments in applications, establishing and interpreting sales policies and practices, caring for system-wide or otherwise complicated negotiations, training industrial personnel, establishing revenue and expense budgets and Division quotas, accounting for the results of all sales efforts, arranging for cooperative efforts with sales allies and other Company departments, and so on.

Division Forces and Duties

The field units—actually 8 separate Industrial Sales groups with from 2 to 7 men each, depending upon the number of industrial customers in the particular area—are the firing-line personnel with customers. Each industrial representative has about 135 geographically grouped customers assigned to his care, and to that group of customers *he is the Company in all matters.*

Considering that these men are promoting all kinds of electric applications to many types of industries, and in some Divisions are caring for gas and steam services as well, it follows that their training and supervision must be quite broad. Naturally they frequently get into situations they can't handle alone and in such cases the local Industrial Supervisor helps out, or a call for help is made to the general office, and the Technical or Customer Service staffs help out. However, no matter from what source help may be obtained, it is directed to the customers' needs through the original representative, thus maintaining his complete Company identity with the customer.

The duties of the field personnel are pretty generally spelled out for them in "Job Definitions" prepared and issued by the General Office. Naturally these men perform many additional services in behalf of customers and the Company as situations arise.

The functional set-up for power sales work described above takes somewhat similar form when outlined on the Company's personnel organization chart. However, in this set-up, whereas the General Office group maintained direct functional supervision over the field forces, it has only an advisory connection with field personnel problems.

Importance of Industry Emphasized

We emphasize with our men the need for keeping a healthy regard for the importance of industry to a community. This we point out is not so much a matter of encouraging representatives to concentrate on the large jobs with large customers. These will pretty generally take care of themselves. Actually, the average industry in our territory is not large. It employs only 70 people. Though small, such an industry does account for the establishment of 100 homes in the community, 15 commercial enterprises and more than 800 acres of productive farm lands. For these important economic reasons, we can't afford to overlook any opportunity to keep small industries producing profitably. Our problem, therefore, is to encourage representatives to approach all industries, even the smallest, with the same enthusiastic offer to help.

Support the Free-Enterprise System

The free-enterprise system, a matter of industry-wide concern, is covered in our Company chiefly through our Supervisors' Conference program. Supplementary indoctrination and training are included in our Industrial Sales Training Conferences as institutional discussion topics. Since the need for training in and promotion of the principles of free enterprise are integrated or should be integrated into the general employee information programs of all businesses, they will not be discussed further here.

All Sales Department Employees Receive Basic Sales Training

Before starting discussion of training slanted at the industrial market, it is appropriate to mention that the EEI Basic Sales Training Course is given to all sales department employees as early as possible after employment. This

generalized training in sales procedures is being supplemented at the present time by "Selling Against Resistance" by Richard C. Borden—a Dartnell release. This supplemental course deals with special techniques in many phases of sales work and serves both as an advanced trainer and as a refresher in sales work.

Training Sponsored by the Industrial Sales Department

The remaining 6 items of our 8-point training job are the particular objectives of our Industrial Sales Training Conferences. These 6 items are, in terms of our journalistic friends, the 5 W's—Who, What, Why, When and Where—that make for important sales news. These Conferences reach out to include all of the available associated training media.

The big field for specialized training in industrial power sales work is in service applications and competitive power. These are properly the points of concentration in our training program, for without an intimate knowledge of utility service applications and their relative economics, backed up by effective grounding in salesmanship, a power salesman gets little opportunity to promote good will with customers and to create the snowballing effect on sales that results from customer confidence.

The training received in engineering schools has been inadequate in preparing men for this type of work. This is not surprising in our case, considering the great number of specialties that must be developed in selling three kinds of service for many types of applications among several classes of industries. Actually our problem is simpler than it sounds for we train men only in electric applications, since electric revenue accounts for about 90 per cent of our Company's total revenue.

Industrial Sales Training Conferences

Our training program for applications is based upon the EEI POWER SALES MANUAL, and the training conferences have been developed following the form outlined in the EEI INDUSTRIAL SALES TRAINING HANDBOOK. We hold five one-day training conferences a year, most of them being divided into 3 regional meetings to minimize travel and hold attendance under 20. One meeting each year takes in the whole group at one of the Company's recreational spots, with most of the day devoted to inspirational and morale building talks followed by good fun and fellowship.

These training meetings are conducted on the true conference principle, with everybody voicing opinions and contributing comments. The meeting programs are worked up sufficiently in advance to permit time for preparation by all participating. Review of certain reference material is suggested for "brush up" purposes. Several field men are assigned to lead certain discussions at these meetings. This provides an opportunity for each man to gain experience in thinking on his feet, self confidence and the ability to get his story across.

"Know Your Industries" Studies

As an example of the scope of application study at one of these training conferences, we recently ran a series of "Know Your Industries" Studies. The industry selected was announced in advance, and each representative was requested to visit a plant of that type prior to the training meeting. He was expected to come to the meeting prepared with a rough flow diagram of the processes involved on which he had noted all of his suggestions for applications of the Company's services, beginning with the possibility of illuminated signs, walkways and parking areas at the approach to the plant and continuing through the plant from the raw material receiving to the shipping departments. Locations were to be indicated for possible use (or additional use) of lighting, heating, air conditioning, refrigeration, materials handling, electronic controls, prime mover equipment, etc.

Personalized Investigation

The conference leader devoted about one hour at the training meeting to discussing and listing all of the suggestions made by individuals. There was competition among divisions to see which group could come up with the greatest number of suggestions. In this way, a total of 35 to 40 men were contributing personalized investigation toward a summary of information greater than possessed by any individual, and much more realistic and lasting than "book learning."

This feature was of great help in getting the new men acquainted with the processes and requirements of particular types of industries, and served very well as a refresher for the older men. At the conclusion of the study of a particular type of industry a comprehensive flow diagram was made and the desirable applications were listed with process or plant locations where they could be used profitably.

Continued use is made of this information by representatives before they go into a plant with which they are not fully familiar, to support a more intelligent interview and to help avoid overlooking any potential sales of service applications. So far, these industry studies have covered textile throwing, meat packing, dairies, foundries, breweries, flour and feed mills, bakeries and printing plants.

Training Program Is Varied

Our Industrial Sales Training Conferences have now been in operation so long that we have had to go beyond the scope of the EEI training material. This has been necessary to provide the latest possible information on applications and to introduce sufficient variety into the training programs to make them interesting and looked forward to by the men. We are now including:

Ways of selling,
How to improve customer relations,
Discussions of cooperation with sales allies,
Cooperation with other Company departments,
Review of general business conditions throughout the area,
Review of the general competitive situation,
Explanations of changes in Company's tariffs, policies and practices,
News about the Company's activities generally,
Inspirational talks on "selling" as a profession, and
Inspection trips of customer or Company plants.

Training for Effective Work With Sales Allies

As an example of bringing sales allies into our training picture, we recently had several important General Electric Company personnel spend some time at one of our regular Conferences. At our meetings to be held next month, we will review electric heating applications as they were developed for our men at the Westinghouse Electric Heating School. This program will be put on at two meetings by our 10 men who attended the School. These two training sessions will be attended by several

representatives of the J. V. Calhoun Co., an electric heating jobber very active throughout our territory.

Attendance at these meetings by our sales allies provides for the coordination of mutual sales objectives and improves acquaintances among representatives of both groups. The ready exchange of information makes possible a stepped-up sales tempo, and helps create the enthusiasm and stick-to-it-iveness necessary for each group to accomplish the utmost in sales.

Intra-Company Cooperation

Cooperation within the Company has been greatly improved by having various Company groups participate in the Industrial Sales Training Conferences. These have included Meter Department personnel (after all the Meter Readers are our back-door salesmen), Test and Relay men who check customers' facilities at the point of contact with our system, Mechanical Test men who help in customer plant surveys—particularly of a competitive nature, Lines and Substation people who, of course, are important to the adequacy of customer services, Rate & Contract heads with whom we work in the pricing of Company services, Engineering Research men who keep us informed of important new developments of the Company's system, and Generation Department officials who are "hosts" to our customers and ourselves in plant visitations. Of course our meetings are always open to, and frequently receive contributions from, personnel interested also in developing our other sales classifications.

Sales Department Participation

In addition to participation by Company groups in our Industrial Sales Conferences, all of the Sales Dept. Heads have presented their 1950 Sales Programs to other Company Dept. Heads, and have had the program included as a subject of discussion in the Company's Supervisors' Conference Program.

The employees' stake in the success of the overall sales program, and the part they were expected to play in putting it across, were emphasized by:

1. Asking them how many salesmen they thought the Company had. After receiving estimates of varying numbers — usually somewhere around the number of people in the Sales Department — the employees were told that the Company had about 7000 salesmen, including *you* and *you* and *you,* and that we were sincerely hoping for the full help of everyone on the payroll.
2. Suggesting to them that everywhere they go, they continually ask themselves "Couldn't *that* be done better — electrically?", and transferring that thought to their friends, neighbors and social and business acquaintances.

Important "Odds and Ends" of Training

Additional items covered in these training conferences include discussions on how to know when you have reached the "key" customer man or men in the negotiation (according to whether the emphasis is on operation, production or capital cost), how to turn complaint and service calls into sales calls, the important sales points to stress in writing letters and preparing reports, how to handle with customers a discussion of proposed changes in rates, fuel adjustment clauses, etc. As an example of a part of this work we had the division men prepare and act out skits showing first the "wrong way" and then the "right way" of sales negotiations covering the following points:

1. Get acquainted calls on a new customer.
   (a) Representative calling on customer alone.
   (b) Representative introduced by former contact man.
   (c) Representative introduces Company "Specialist."
2. Taking care of a high bill complaint, converting it into a sales opportunity.

Skits as Training Aids

Since we had three separate meetings of this particular conference we obtained quite a variety of skits covering these points. These skits were reproduced under a common binding and returned to all representatives to let them know the points brought out in all the meetings and also to serve as training material for new men on customer approaches and follow-through.

The opportunity afforded by these training meetings is used for the distribution of manufacturers' literature covering applications and for the showing of manufacturers' films, particularly the "More Power to America" product and industry series. So far we have not had any manufacturers talk to us about their specific equipment, since we feel that the men get a better understanding of the value of such equipment in relation to their customers' needs if they search out the selling points for themselves.

A great deal of training is also accomplished at meetings to which we send our representatives as part of their work. These include meetings and demonstrations held by manufuacturers in the area or nearby (such as Westinghouse "Productive Power," General Electric's Nela Park, Heating Schools, etc.) and will include the coming General Electric "Exhibit Train" and Lighting Clinics. Our men also get a great deal out of our annual Pennsylvania Electric Association Industrial Conferences, the meetings of the Interstate Power Club of New York and Community Industrial Exhibits. This year we are participating for the first time in an Industrial Conference now being promoted by the Pennsylvania State College.

Continuing Education

Our men are encouraged to participate in training courses in effective speech, and in college extension work of a nature that will serve as continuing education and self development. They are encouraged to belong to technical societies and, where the program is of direct benefit to their work, attend meetings partly or entirely at Company expense.

Professional Status in Engineering

We feel that it is necessary and proper that our men work toward the Professional status in Engineering—first as Engineers-in-Training, which is a classification available to them in Pennsylvania immediately upon graduation from an accredited Engineering School and later as Registered Professional Engineers upon obtaining the necessary experience in Engineering-type work. This is important from several angles. It encourages continued self-development and guards against a loss of interest in his chosen profession. Also, the attainment of Professional Engineer status gives a man the credentials necessary to approach a customer with confidence and to talk with his engineering personnel on an equal footing. This enables our representative to gain the customer's confidence quickly and gives more weight to his suggestions and recommendations.

Further, we find frequently that the customer's key men are also Professional

Engineers, which provides additional opportunities for becoming better acquainted by attendance at Professional Engineer meetings. This phase of self-development is practically a necessity for best results in dealing with customer problems through consulting engineers.

Monthly Letter as a Training Tool

Another opportunity for the training of our men is the publishing of the Industrial Sales Department's Monthly Report. Originally, the sole purpose of this report was a monthly statistical accounting of the industrial activity in our territory. It has now grown to an average of about 15 pages, and includes much of a training nature. For example, it contains case histories of important jobs stirred up or sold during the month, newsy notes of a personal nature about the men—particularly if congratulations or credits are in order for outstanding work in the industry or community, a competitive accounting of the Divisions' Sales Performances, and news of local competitive activity that might become system-wide.

A feature each month is the selection of what is considered to be the outstanding industrial sales or customer relation job, and for this the deserving representative receives the "Reddy-salute" of the month.

This report has wide circulation, going to some 200 key men in all Company departments. It is of great value in making these men industrial sales minded, and many instances of their active support have resulted from their better appreciation of our problems as outlined in the monthly report.

Use of Sales Tools in Training

We stress the value of all of our sales tools as training materials. For example, we expect each representative to peruse carefully, current issues of *Electrified Industry* and to remember applicable cases as they call among the 40 per cent of our customers who receive this outstanding magazine of electric applications. They are also prepared to show customers who do not receive the magazine regularly, pictures and stories of new applications suitable to their particular plants. The same procedure is followed with the various issues of *Electric Heat in Industry, Chromalox News,* etc.

We want our men to make judicious use of available Company facilities and equipment which can help prove our points with customers. These facilities include mechanical and electrical test equipment and trained personnel capable of making lighting and wiring layouts and general plant surveys. At one of our recent training meetings we asked ourselves the question as to what extent the Company was justified in offering to do test, survey and layout work for customers. Also, what kinds of tests and surveys had greatest sales value, and how the information obtained in one customer survey could be used to advantage among several customers to spread out the rather considerable cost of such work. We are still batting this one around.

During the Fall 1949 Industrial Lighting Campaign we introduced a new feature—that of supplying to each of our divisions, demonstration lighting units to be used for trial installations in customers' plants. These units were of a universal industrial type that could be installed and removed easily, giving the customers (and equally important, the employees) a practical demonstration of the need for improved lighting in certain parts of the plant. These demonstration units have been of great help in accomplishing many quick sales among the smaller industries.

Conference Results Demonstrated

While on the subject of the Fall of 1949 Lighting Campaign, you may be interested to know that we used some of the time of one of the recent training sessions to take that campaign apart to find out what there was about it that was good, and what was not good. The spontaneous, frank observations of the men concerning that campaign were:

1. A lighting campaign is a good door-opener to get representatives into parts of the plant not ordinarily visited. This leads to potential sales of other services.
2. Lighting is an application which can be used by all customers, and a campaign gets the representatives to visit greater numbers of customers within the specified period.
3. A plant improved by good lighting is a natural for the consideration of further plant improvements, particularly air conditioning, painting, etc.
4. Any campaign conducted in the Fall of the year has the disadvantage of coming at a time when the customer's budget for plant improvements is practically exhausted. This may prevent a sale or delay it considerably.
5. Campaigns of any kind tend to cause men to hold up on sales they know would materialize in the near future so they will get credit for them during the campaign period.
6. During the period of a campaign, approximately 75 per cent of available promotion time is spent on that particular application. This may lead to temporary neglect of sales of other important applications.
7. A lighting campaign is easier for new men to carry on than a campaign for heating or some other type of application because in general less knowledge of detailed process is required.
8. During the period of a campaign we are likely to be trying to sell the customer on some particular application when actually he wants to talk to us about some other application for which he feels he has greater need. This conflict may slow up the sale of both applications and depreciate customer relations.
9. Is the E. A. R. obtained from a lighting campaign as great as from the sales of other applications that might have been made with like effort during that period?

With a little help from the conference leader, all of these points were resolved satisfactorily to clear the thinking on the subject and to set the stage for more intelligent sales planning and promotion. We like to think of this example of conference technique as typifying our constant effort to improve sales management by listening to and applying the sound thinking of our firing-line men.

Training in Customer and Public Relations

The improvement of customer and public relations is stressed at our training conferences by emphasis on the deportment of the representative while in the customer's presence or in his plant. For example, we point out the need for our men to observe all of the customers' regulations concerning smoking or other personal conduct, and the safety regulations existing within the plant.

We urge our men to make friendly suggestions on matters which would be to the customer's advantage even though

such suggestions might have no direct bearing on the use of our service. In addition, we think it important to keep customers informed in advance of any of our plant or tariff changes that would affect his operations; to tell him of meetings, research facilities, etc., available for his benefit; and to help him develop his market and make use of additional plant capacity or vacant building space. We are also on the watch for sources of raw materials or equipment the customer may need, improvements in materials handling and production line flow and new products that might be manufactured as a supplementary line to smooth out month-to-month production curves.

Waste and Surplus Disposal

We help customers dispose of surplus equipment and waste materials (this is doubly important if the surplus equipment and waste materials are in any sense competitive with our services), help them locate and get contractors on the job, provide program material for their employee meetings, compliment them on accomplishments of a local or national nature, cultivate their interests and hobbies and take them on trips to inspect the Company's plants and equipment (such as proposed for our new Sunbury plant openhouse).

These activities have several advantages in addition to their direct application to sales. They act as a reminder to the customer of our friendly service in the event he is approached by a "rate scalper," give him an appreciation of the reasons back of some seemingly strange procedures followed by a regulated industry, provide a reservoir of potential purchasers of Company securities, etc.

Reddy Kilowatt Letters

We had occasion just recently during a severe sleet storm in a portion of our territory to need all of the customer relations we had been able to develop over the years. Some customers were out of service for considerable periods even though we brought in over 700 linemen to restore services in the area. We were unable, of course, to keep in constant personal touch with all customers during their period of interruption. Therefore, many were sent a friendly Reddy Kilowatt letter telling them that we appreciated their inconvenience and patience, and assuring them that we were still working night and day to restore their usual good service. This letter had great acceptance from quarters that could have been very embarrassing.

In addition to the training we give our men on factors involved in direct competition such as the replacement of private generation with purchased power, we encourage them also to keep up with the general competitive situation. The purpose of this training is to encourage customers to use their optional dollars for equipment which utilizes our services instead of perhaps for some totally unrelated items.

Information needed by the representatives for such work includes price trends and market conditions in the customer's business, his tax status and depreciation and equipment purchasing policies, the factors which affect his break-even point, etc. Relations have been improved in many instances because our representative has been informed on these matters to the point where he could help the customer make the best possible use of his money for plant improvements or expansions.

We are at present compiling a Product Survey of the manufacturing plants in our territory, in which will be listed the principal products of each. Copies of this survey will be distributed to the contributing customers, to build up a greater interdependence by stimulating trading among producers in the area.

Supervision

There are several parts of our work which may be singled out as primarily of a supervisory nature. Among these are the constant attempts to have the representatives so arrange their necessary routine work that it may be completed in a minimum of time, thereby making available a maximum of sales promotion time. We introduced a time study among our representatives about three years ago and learned that desk duties, customer service work, work for other departments and similar "displaced persons" time, together with non-organized methods employed, resulted in only about 23 per cent of a representative's time being available for the direct promotion of sales. We sifted the work of the representative, discarded or transferred as much of the non-productive as possible, streamlined what remained and learned upon rechecking about a year ago that the available time for promotion had increased to 52 per cent. We are still whittling away at the non-productive 48 per cent.

Simplify Record Keeping

One of the ways in which we streamlined necessary desk work was to introduce a complete new system of call slips, prospective business records and summary reports of accomplishments. The parts of this record system were so arranged and keyed that the only requirement on the part of the representative after making a call was to place a few *x*'s or numbers in prepared squares, fill in the customer's name and briefly outline what was accomplished during the call. The processing of the call slip into continuing records of prospective new business, summaries, monthly reports, etc., is now just a matter of simplest clerical help.

In addition to cutting down the time required for an onerous task, the new system gave us flexible records, showing within a few minutes for any division the available business according to the various types of applications. This prospective business file is also useful to the divisions in preparing estimates of sales for the budget year ahead, and makes realistic and quick a job that was previously very approximate and time consuming.

Each representative has his own file of active jobs and can determine his own performance ahead of any inquiry on the part of his supervisor. In addition to the prospective business forms, our men keep the usual simplified records of customer information to facilitate negotiations whether by visit, telephone call or correspondence.

Reduce "Displaced Persons" Time

We have worked with other departments of the Company to get them to assume their full share of work which our men had been doing to some degree for them. For example, we have a department which negotiates rights-of-way, except that in some cases they have been asking the power salesmen to do it for them. Also, we have a billing group whose job it is to calculate and check customers' bills. In some instances our representatives were being asked to calculate particularly complicated bills, or at least to check them. Now, such bills are simply released through the representative for whatever value they might be in current negotiations.

Need for Mass Sales Promotions

In a further attempt to reduce selling costs, we have been doing some work on determining the effort required to make a sale, and found in a recent overall survey that an average of 11 calls is required from the time an idea is introduced with a customer until the sale can

be completed. It is well known, of course, that industrial sales are tailor-made and, therefore, move understandably slow. In rare instances simple sales can be completed within a month or two, but we have recently completed many on which we have been pecking away for more than 10 years.

We are becoming more and more convinced that there is a good prospect of reducing the cost of selling industrial power by carrying on certain promotions in cooperation with manufacturers of utilization equipment. In such cases the manufacturers and our representative can combine their resources and abilities to put on worthwhile meetings and demonstrations that will be attractive to many customers. We have found in preliminary discussions that the manufacturers are very willing to assume their responsibilities in such meetings. Our job in the combined promotions carried on up to this time has been largely to encourage customer attendance. We like this of course because we feel that the opportunity of shepherding customers to and from such meetings provides additional openings for improving customer relations. An example of this cooperation in action is the series of customer meetings at which the Westinghouse "Productive Power Show" was featured.

Budget and Quotas

We mentioned previously that we established a budget of anticipated sales each year. This budget is the summary of the individual knowledge and estimates of each representative for his particular group of customers, tempered occasionally by special knowledge the General Office may have of conditions ahead in a particular industry. After a budget has been completed from division estimates, it becomes the basis of quotas toward which the divisions direct their sales efforts.

Monthly records of accomplishments are kept, and this information is transmitted to all divisions showing relative performance. In addition to quotas on business obtained, each division also has a quota on the number of sales calls its men are to make, the number of scheduled Planned Sales Presentations covering specific applications in customers' plants, and the number and customer attendance of scheduled Mass Sales Promotions.

Rating System for Division Performance

All of these quotas are built into a rating system by which the performance of the various Divisions is compared. This rating system takes into consideration:

Quota accomplishment
Effectiveness in carrying out the Company's Sales Programs
Effectiveness in planning sales work
Customer relations
Quality of sales personnel, and
Leadership of supervisory force.

Although no prizes are given for favorable positions in the rating system, it can be readily understood that competition is keen among the Divisions not to be too far down the list after all the points are added up.

Incentives

During the past lighting campaign we went into incentives for the first time. In that campaign we arranged for the salesmen finishing one-two-three in the number of points scored to spend some time at Nela Park so that they might become even better informed on lighting sales possibilities and in a position to help their fellow workers who did not have the same excellent results in their lighting sales efforts.

Some comment was heard that it would seem more appropriate to send the losers to Nela Park for apparently they needed the information most. However, it is our opinion that those who have demonstrated greatest self-interest and ability will be most likely to put this advanced training to most effective use.

We are forming a Sales Honor Club this year. The members will be Sales Department personnel, of all sales classifications, who have met certain minimum requirements in sales *and sales training*. A dinner meeting will honor the group winners—who will receive plaques, and individuals—who will receive certificates and appropriate mementos. Of interest to this particular discussion is the fact that both training and supervision are prominently recognized in determining qualifications for membership in this Club.

Optimum Sales Calls

We have made some studies leading up to the optimum frequency of calls on customers. In case you may be interested, we have found that we get adequate coverage by calling on 21 per cent of them once a year, 23 per cent twice a year, 23 per cent three times a year, 17 per cent four times a year, 10 per cent six times a year and 6 per cent twelve or more times a year. One requirement in calls is that every customer shall be visited at least once each year.

Mailing Lists

For the most part, the Division sales units make up their own mailing lists for promotional pieces, inviting customers to meetings, etc. We offer little supervision in the preparation of such lists, but suggest that they include customers who show greatest promise either by their progressive attitude or by their obvious need for whatever it is we are promoting at the time.

Division Commercial Managers Conferences

Many of the problems relating to supervision of field personnel are talked out at round-table conferences between the Division Commercial Managers and the Sales Department heads. These meetings are held at intervals of about 6 weeks.

A Good Sales Offense Is the Best Defense

The stress we now place on training and supervision in developing effective industrial sales promotion is somewhat new even to us. It is a departure from the defensive approach formerly so common among utility companies. Even now I can sense reluctance among my associates in other Companies who feel that power salesmen should be left pretty much to plod their own ways, learning from hard knocks and smugly ignoring principles and procedures so successful in other sales classifications. These have probably not experienced the potency of a combination of the Sales Profession with the Engineering Profession.

The objective in establishing budgets, definite quotas, rating systems, man-to-man competition—yes, even *pushing* salesmen into leadership situations—is certainly not intended to depreciate self-esteem or the regard in which a professional-type man is held by others. On the contrary, we feel that really good men thrive on beating reasonable bogeys, realistic deadlines and fair competition. When they have made the grade we like to be prompt with acknowledgments and deserved recognition.

"The proof of the pudding—"

Power Salesmen like case histories. Here's one that pretty well sums up the effectiveness of our methods, and gives us assurance and encouragement to go on. One of our representatives—we'll call him Johnny, for that's his name—had been calling regularly on a customer who suddenly wanted an extension to a new location. However, because of construction difficulties, we would be unable to furnish service within the specified time. Also, our construction guarantee for the speculative-type business involved would result in substantial interest payments by the customer.

Johnny had done his sales and customer relations duties well, and therefore felt no hesitancy in suggesting—even arranging for—the temporary use of Diesel generating equipment which had been replaced by purchased power at a nearby location. Further, he reminded the customer that he could use Company securities for deposit in place of cash, at a neat saving in interest cost.

We might have felt apprehensive of deliberately introducing a Diesel into a customer's plant had Johnny been negligent either in learning or applying practical salesmanship. In a sense we were "treading on eggs," and this could have been disastrous if the eggs of "customer relations" had been scattered about haphazardly. As it was, the eggs of "customer relations" were in good order—upright—and as you scientifically-minded people know, were capable in this position of supporting substantial additional sales.

The happy ending of course—the customer and Company were fully satisfied. Johnny was happy too. He had earned a "Reddysalute!"

Making Our Own Tomorrow

(*Continued from page* 189)

schedule, most of these pitfalls can be avoided.

A further factor closely related to the above and one almost invariably taken into account by management in considering an employee for advancement, is the reputation he enjoys in the community at large. Business organizations can ill afford to place in positions of responsibility men who fail to have the respect and confidence of members of the community which they serve. Not only may the financial success of the company be affected through loss of customers, but the attraction of desirable personnel may be retarded to a considerable degree.

Personnel Are the Measure of the Company

While it is true that a company is known by the quality of its product, it is equally true that a company prospers in the long run in direct proportion to the competence and integrity of its personnel and it cannot be placed in such a position that the attraction of personnel of high caliber is jeopardized. In this latter consideration, few industries are more directly affected than the utility industry whose very freedom and privately owned status in the present political climate is dependent to a very large degree upon favorable public relations.

Devotion to the Job

Finally, success in his job or career, as in life itself, comes to an individual only as he is able to lose himself in his work. When our jobs become more important to us than the clock on the wall, and we literally find each day passing too rapidly for the work which we want to accomplish, we are truly on the right path. Paradoxically, success does not come to him who seeks it. He who achieves it does so because he has not been seeking promotion and success per se but has devoted his energies and abilities toward doing his job better than it has to be done through pure devotion to that job.

Abraham Lincoln once expressed a bit of wisdom which, in its broader sense, pretty well sums up what has been said here: "I will prepare myself, and my chance will come."

P.U.A.A. Convention Elects New Officers, Makes 162 Awards in Better Copy Contest

PUBLIC Utility Advertisers set the stage in their Annual Convention in Kansas City, Mo., May 11 and 12, for a stepped-up tempo in the fight against socialization of the electric light and power industry. J. B. Thomas, President of the Texas Electric Service Co., and J. Stanford Smith of General Electric Co. emphasized the need for action on this major problem. Tom Collins of City National Bank, Kansas City, stressed the value of public opinion.

New officers of the Public Utilities Advertising Association elected for next year were: President, W. B. Hewson, The Brooklyn Union Gas Co.; 1st vice president, J. E. Canfield, Wisconsin Power & Light Co.; 2nd vice president, P. L. Penfield, The Detroit Edison Co.; 3rd vice president, W. G. Heren, Union Electric Co. of Missouri; and treasurer, Mead Schenck, Interstate Power Co.

Closing feature of the convention was presentation of awards in the country's oldest copy writing competition. Now in its 29th year, the P.U.A.A. Better Copy Contest drew over 2,000 entries in 20 different classifications. One hundred and sixty-two certificates of excellence were presented by this year's contest chairman, Walter G. Heren, Union Electric Co., St. Louis, Mo.

Some Current Collection Practices and Their Effect on Customer Relations

By H. S. Hahn
The Ohio Fuel Gas Company
and
By F. J. Flom
The Detroit Edison Company

An address before the National Conference of Electric and Gas Utility Accountants, Louisville, Ky., April 17-19, 1950

THE FREE enterprise system, as we have known it, is today fighting for its very existence. In a large part of the world it has been replaced by communism; in England it has been gradually giving way to socialism. Among the first industries to be nationalized in England were the public utilities.

In our own country, we have, during the last 15 years, witnessed the growth of public power. The present administration is sympathetic toward this program and can be expected to promote it still further. The privately owned utilities of the country should, therefore, be well in the forefront of the fight to prevent further incursions by government into the field of business. In this fight, all utility employees have a very vital interest. Employees who have contacts with customers are in the fortunate position of being able to help sell the American Public on the advantages of private ownership and operation of public utilities.

A Special Challenge

Those of us who are in collection work are presented with a very special challenge. Our public contacts are not only among the most difficult, but also in many ways the most important. Failure to deal intelligently (and sympathetically when appropriate) with customers who owe past-due bills, can very quickly destroy goodwill which it has taken years to build. On the other hand, through skillful handling of the collection transaction we can maintain and even build customer goodwill.

With these thoughts in mind, the Credit and Collection Subcommittee of the EEI and the Customer Collections Committee of the AGA sent out questionnaires covering current industry practices in several areas of collection work.

Replies to the questionnaires were received from 71 companies having 16,887,645 electric customers, and 11,040,259 gas customers. This report summarizes the practices of those companies and wherever appropriate, includes the observations and opinions of the committee responsible for its compilation. When the number of answers to a particular question do not add up to 71, it means that some companies did not answer the question or that the answer could not be used.

Use of Collection Letters

One of the surprising things brought out by the questionnaire is the fact that only thirteen of the utilities reporting write any collection letters before referring accounts to collectors. This might indicate a tendency in the industry to throw all accounts into one basket, using the same notices for all customers. The utilities using collection letters feel that they offer these advantages:

1. Special recognition for customers of long standing or with exceptionally good credit records. Even a small amount of such personalized handling is definitely a step in the direction of good customer relationship.
2. Additional collection steps beyond the printed notices reduce the number of accounts referred to collectors.

Elimination of Field Collectors

There has been considerable discussion in the industry during the last few years about the use of field collectors. In a few instances, such field collections have been eliminated on the ground that they constitute an unnecessary operating expense; that a "deluxe service" is being operated for a small per cent of the customers. These companies have substituted field representatives for the collectors. When necessary, they call at the customer's premises to disconnect the service, but they are not permitted to accept any payments.

The committee was anxious to learn how many utilities had discontinued field collections. Except for three utilities, all of those answering the questionnaire reported that they are still accepting payments in the field. However, several of the utilities indicated that they are making a more sparing use of collectors. This deduction is based on the replies to the following question:

"What per cent of the accounts that you receive for collection treatment are referred to field collectors?"

Present time_____% 3 years ago_____%
10 years ago_____%

Twenty-nine utilities reported a smaller percentage of accounts referred to collectors now than 10 years ago; 18 reported a decrease from 3 years ago. The percentage of accounts received for collection action that are being referred to collectors at the present time are as high as 80 per cent, with the majority ranging between 35 and 60 per cent.

Cost of Field Collections

The committee is well aware of the cost involved in field collections. It does, however, want to call attention to what it considers to be some of the dangers from a customer relations standpoint of the "no field collections" policy:

1. Even though the customer may know about the policy, he is likely to resent the field representative's refusal to accept a payment.
2. Refusals to accept payments might increase the number of non-payment service disconnections.

Ratio of Collectors to Total Number of Customers Served

The relationship of the number of collectors to the total number of cus-

tomers served is, of course, affected by a number of variables; such as, metropolitan or urban territory; extent of industrialization; economic status of the average customer; etc. We have attempted to recognize some of these differences in our questionnaire, which showed that the ratio of collectors to the total number of customers served ranged, for the majority of companies replying, from 1 collector for every 10,000 to 1 for every 30,000 customers.

Minimum Amount of Accounts Referred to Collectors

A considerable change has occurred in the last 10 years. Collectors' salaries have increased from 50 per cent to 100 per cent. The value of the dollar has decreased some 30 to 40 per cent. These changes mean that we are spending more money on each collector's call. In view of these circumstances, the committee wanted to determine how many companies, if any, had raised the minimum amount of accounts (exclusive of finals) referred to collectors. The following is the answer to this question:

	Minimum Raised						
No change	No Amount given	$1.25	$1.50	$2.00	$3.00	$4.00	$5.00
43	7	1	1	6	3	1	4

The committee also tabulated the present minimums of both current and final accounts for those companies which furnished this information:

Present Minimum for Collector Calls

Current Accounts	
Minimum	No. of Companies
0.00	3
1.00	2
2.00	5
2.50	2
3.00	7
4.00	3
5.00	20
7.00	1
8.00	3
10.00	8
15.00	2
20.00	1
No. of companies reporting	57

Final Accounts	
Minimum	No. of Companies
0.00	9
0.25	1
0.50	1
1.00	11
2.00	2
3.00	5
5.00	4
7.00	3
10.00	5
15.00	4
Depends on Credit Record	1
	46

Twelve companies reported minimums on current accounts, but did not furnish an answer for final accounts. It might be assumed that those companies do not have a minimum on final accounts and could be added to the 9 companies so reporting. As indicated by the above statistics, 22 of the 46 utilities that answered the question do not refer final accounts under $3.00 to collectors; 35 utilities reported a minimum of $5.00 or higher on current accounts.

Latitude Granted Collectors

All but three of the companies reported that they allow their collectors to use discretion in the field; all but seven permit their collectors to accept partial payments. The answers to both of these questions show that on the whole, the industry is recognizing the circumstances of the customers when carrying on field collection work. One of the companies that has eliminated field collections, specified that its field representatives are authorized to grant additional time in case of sickness, death, or other unusual circumstances.

Use Made of Service Disconnections

The results of the questionnaire disclose that, on the whole, service disconnections are being used sparingly. True, there are differences between companies in the extent to which they are used. These differences are undoubtedly due in part to the character of the territory served; partly to the differences in company policies. We found that the ratio of service disconnections to the total number of customers served for the first 10 months of 1949 for 45 per cent of the companies reporting ranged from a low of 1 disconnection for every 800 customers to 1 disconnection for every 100 customers.

Service Restoration Charge

A charge for restoring a service that has been disconnected for non-payment is usually justified by two arguments:

1. The customer should pay for the extra expense that he has caused.
2. Knowing that he will have to pay such a charge, the customer will make a stronger effort to avoid having the service turned off.

Although a majority of utilities have a re-connection charge, some consideration might be given to these observations brought out in the committee's discussion:

1. The amount collected through re-connection charges represents only a small part of the total collection expense.
2. A re-connection charge tends to have an adverse effect on customer relations.

The questionnaire shows the present practices of the companies answering this question to be:

No charge, 21; *$1.00 charge,* 30; *$1.50 charge,* 3; *$2.00 charge,* 9.

Seven companies reported that their collectors wear uniforms. In three of these companies, however, field collections are handled by a combination collector and service man. Of the four remaining companies, the number of collectors were 1, 3, 5, and 38 respectively. Three of the companies paid for the uniforms; one paid one half of the cost. Only one company (38 collectors) paid for cleaning and pressing the uniforms.

Collection Agencies

The advantages of using collection agencies are too well known to be the subject of a questionnaire. The committee's purpose was to find out if the industry was making the maximum use of this very effective bill payment medium. It was also the committee's purpose to determine current operating practices in connection with collection agencies.

Sixty-four of the 70 companies reporting stated that they are using collection agencies. One company is in the process of setting up agencies. Three of the remaining five reporting in the negative were comparatively small companies.

American Express Agencies were used by twelve companies, seven of which also had a substantial number of their own agencies.

Ratio of Collection Agencies to Customers

Collection agencies provide these advantages, all of which make a contribution to good customer relations:

1. A convenience for the customer.
2. A curb on past-due bills.
3. Establishment of a closer contact

with a number of commercial customers.

4. An opportunity for the person or firm having the agency to provide another service for his customers.

To profit fully from these advantages, it is important to have a good distribution of collection agencies. There is no known formula, as far as the committee knows, for determining what constitutes a good distribution. An answer worthy of thought, however, is that agencies should be located in all shopping centers; such as, primary (downtown), secondary, and neighborhood.

The committee felt that it would be helpful to compare the ratio of collection agencies to the number of customers for all of the companies reporting. The wide variation in the use of collection agencies is well illustrated by this comparison, the range being from one agency for every 41,000 customers to one agency for every 300 customers.

Percent of Bills Paid at Collection Agencies

The per cent of bills paid at collection agencies ranges all the way from 1 per cent to 70 per cent of the bills rendered. As is to be expected, the larger percentages are for metropolitan areas.

The results of our questionnaire show that as a whole, the industry can make a considerably greater use of collection agencies.

Eighteen utilities reported that they had unauthorized agents. One questionnaire was noted "How Can You Stop Them?" The committee doesn't presume to have the answer to that question. It does feel, however, that unauthorized agencies can be kept at a minimum if you have a good distribution of authorized agencies. A substantial number of unauthorized agents would probably indicate that they are filling a real need and should be placed in the authorized status. One company reported that unauthorized agency collection incidents average less than one every 2 or 3 years. This company operates in a metropolitan area and has a ratio of one collection agency for about every 700 customers.

Types of Businesses Used for Collection Agencies

The most popular types of businesses being used for collection agencies are banks and drug stores. Groceries, appliance shops, and hardware stores follow quite closely. A variety of other businesses are chosen including general merchandise stores, variety stores, real estate offices, cleaning establishments, service stations, post offices and libraries.

Fees Paid to Collection Agents

The following is a summarization of the most common fees being paid, *the utilities bearing the cost in all instances:*

Amount	1¢	1½¢	2¢
No. of Companies	2	1	2

Six graduated commission plans were reported. Typical of such plans is the following:

5¢ a bill for the first 200 bills collected.

3¢ a bill for the next 700 bills collected.

2¢ a bill for any excess over 900 bills.

Fixed salaries; flat monthly commission; an assured monthly minimum were other variations reported. Only four companies paid commissions on a percentage of the bill basis, 3 per cent being used by one company; 2 per cent by two companies; and 1 per cent by another. Three companies reported that they did not pay any commission to the agents.

For the most part, remittances are mailed in by the agents. "Pick-ups" by the utility are limited to a few companies with a relatively small number of agencies. In the "mail remittance" arrangement, 48 utilities pay the postage; in 7 instances, it is paid by the agent.

Advertising Collection Agencies

Such advertising is primarily for the purpose of:

1. Giving publicity to a new agency.
2. Informing a customer about the nearest agencies when he moves into a new neighborhood.

The most common mediums being used to accomplish these ends are:

1. Sign on the agent's premises.
2. Plywood cutouts, such as "Reddy Kilowatt" on the agent's premises.
3. Decals on the window or door of agency.
4. Listing the agencies on the back of the bills. This is perhaps not too feasible for the larger utilities.
5. A periodic listing, once or twice a year, of all the companies' agencies on a leaflet which can be given to new customers; can be sent out with all bills; or can be passed out in the companies' offices. One company has named its leaflet "Here Are Step Saver Maps." The leaflet includes a map showing locations of the agencies in a metropolitan area of 112,000 customers.
6. Notice to all customers in the area when a new agency is established.

Fixed Amount Per Bill	3¢	4¢	4¼¢	4½¢	5¢
No. of Companies	6	2	1	2	23

7. Special notice or letter to new customers which is feasible in smaller companies.
8. Newspaper and radio advertising.

One company reported that it provides and maintains an electric sign in front of the agencies' place of business.

Collection of Past-Due Bills by Agencies

Forty-four utilities reported that they permit their agents to accept payment of past-due bills. Seventeen companies restrict their agents to the collection of current bills. Allowing agents to collect past-due bills constitutes another service for customers. It also raises the problem, however, of how to prevent collection action between the time the payment is made and the time it reaches the office. The only effective method to do this would be for the agent to telephone the utility when payment is accepted on a past-due bill. Only two companies reported that this is being done. The other most frequently mentioned safeguards were:

1. Checking with the agent before working accounts. This plan is somewhat impractical for the larger companies.
2. Daily remittances by agent.
3. Checking with the customer before turning off the services.

In spite of these safeguards it appears that permitting agents to accept payment of past-due bills does result in some collection work after the payment has been made. The possibilities of such collection action is considerably lessened when past-due bill payments can be made only at company offices with prompt notification to the collection department.

For the most part, the larger utilities have contracts with their collection agents. However, among the 26 companies who have oral working agreements was one with 869 agencies; 3 others who had over 300 agencies each;

and one company with 700 unauthorized agents. Thirty-seven companies have written contracts. The purpose of the written agreement is to spell out the terms of the agency arrangement and to settle any misunderstanding. One of the large utilities using an oral working agreement expressed the opinion that it helped to promote a more personal and friendly feeling between the agent and the company.

Company Branch Offices

Company branch offices perform a number of very useful services for customers. Numbered among these are the transactions with customers who owe past-due bills. These transactions, with prompt telephone notice to the collection department, in many instances eliminate the need for a collector's call.

The practices of the industry with regard to company branch offices are not by any means uniform. Ten companies operating in metropolitan areas (populations ranging from 200,000 to 1,000,000) reported that they didn't have any branch offices. Other companies operating largely in metropolitan areas make rather extensive use of branch offices. These companies apparently feel that a branch office in a large city can build goodwill for the company in the immediate community in which it is located; that part of this goodwill can be built by careful and considerate treatment of customers who call at the offices about a collection problem.

The results of the questionnaire show that at the present time, a rather sparing use is made of this practice. Ten utilities have made arrangements with some of its customers (and the customer's banks) to have bills sent directly to the bank. The amount of the bill is deducted from the customer's checking account and the receipt portion of the bill is returned to the customer by the bank, the same as a cancelled check. The arrangement appears to have some advantages and is a rather painless way to pay a bill. (If you happen to be one of those fortunate individuals who doesn't have to worry about the balance in his checking account.)

In a follow-up of the original questionnaire, 7 utilities reported that they felt the arrangement to be worthwhile; 2 replied in the negative, and one was non-committal. As is to be expected, all 10 utilities reported that the arrangement was in effect only for a small per cent of their customers.

Credit Files—Current Practices

We do not ordinarily think of collection activities as affording opportunities to build goodwill, and yet, the possibilities of doing just that are great. Not, of course, in the case of the deadbeat customers, but rather in the bulk of our collection work which involves people who have good intentions. A variety of causes underlie their failure to pay: sickness, unemployment, inadequate income, or perhaps just plain oversight.

A credit file enables a collection department, especially in a metropolitan area, to approach the treatment given to a customer in a small community. In a small town a customer remains an entity; he doesn't become just an account number. Everyone in Smithville, for instance, knows Bill Brown. He has lived in that white house on the corner for thirty years. Before his wife's serious illness, he had paid most of his bills on time. The doctor and hospital bills, however, put a crimp in his pocketbook. Naturally, we'll carry his account longer than someone who has just moved into town; or longer than we would carry "Slow Pay Jones," who is always in our hair.

In larger communities, we can't get to know our customers that well. A credit file, however, can be a tremendous aid. Naturally, it can't take the place of a personal acquaintanceship with the customer. It does tell us, however, how long he has been a customer; how often his account has been referred to the collection department; how many times his service has been turned off for non-payment. The counterpart of Bill Brown in the city should receive some special recognition. We may not know that his wife has been seriously ill. Our credit file, however, will tell us that he has been a customer for thirty years with a good credit record. Should we follow his account the same as that of "Slow Pay Jones" with a notice and then a collector's call? Or should we interpose some other collection step such as a collection letter or a telephone call? Shouldn't we also carry his account longer?

Credit information can be built up in one of two types of files:

1. A positive file in which we set up a record for each customer.
2. A negative file in which we set up a record only for those customers whose accounts require collection action.

In the negative file the record of the time the customer has used service, and has not had any overdue bills, is missing.

The results of the questionnaire show:

Companies with positive files.....17
Companies with negative files.....24
Companies without any credit files..29

Ten companies did not answer this question and it was assumed that they do not have any credit files.

Industry's Practices are Good

It is the committee's opinion that on the whole, the industry's current practices in the use of collectors and collection agencies are good.

There appear to be opportunities, however, for:

1. More personalized treatment of customers through a greater use of collection letters and telephone calls.
2. Greater refinements in the use of collectors.
3. Expansion in the use of collection agencies and more uniformity in fees paid to them.

In spite of the cost of maintaining credit files, the committee invites consideration to these factors:

1. That credit files can be of considerable aid in building good customer relations which cannot be measured in terms of dollars and cents.
2. That a positive file gives a more complete story on each customer and is preferable to a negative file.
3. That greater use of positive credit files by the industry might well be a step in the direction of better customer relations.

Build Good Relations

In conclusion, the committee again wishes to emphasize its opinion that it is possible to build good relations through intelligent collection work. As one example it wishes to quote from an editorial which appeared recently in a union paper, and which concerns a collector of one of the companies included in the questionnaire:

"There is one man in your organization I'll never forget," he told me, as he unlocked the door of his daughter's flat on..... Street so I could read the meter. The speaker was a colored man with graying temples whose face the passing years had etched with character.

(*Continued on page* 215)

Determining When to Buy

By J. D. Hogg
The Cleveland Electric Illuminating Company

An address before the EEI Purchasing and Stores Committee Meeting, Milwaukee, Wisc., April 25, 1950

A UTILITY'S working capital as well as the cost of maintenance and new construction are markedly affected by the determination of "when to buy." Since the shortages of a couple years ago have passed, the problem has again become a matter of policy rather than of expediency. The factors involved are old friends or, perhaps, old enemies.

As a basis for this presentation, an outline of the factors involved was prepared and distributed to the subcommittee assigned to the project for a discussion of each factor.

Basic Methods

Basic methods for determining when to buy appear to fall into three categories.

a. Setting up a general policy based on a review of the economic situation and expectations, this resulting in a plan to have, with few exceptions, a specific period of inventory coverage, say, three months.
b. A review of factors affecting types of items with a policy set for each type.
c. In some cases control is item by item.

No matter what method is used there are a number of factors to consider before the decision on "when to buy" is made. Let's take a look at each of them.

Two broad factors are involved, *Inventory Factors* and *Market and Other Factors*.

Looking first at Inventory Factors, our first consideration is *stock on hand* which can be divided into three categories:

a. Emergency quantities,
b. Quantities on hand for average use,
c. Quantities on hand for specific jobs.

We find that most utilities have a basic emergency stock of a great many items. This practice can certainly be justified on spare parts for capital equipment. If, however, there is a basic policy to have on hand a three-month supply, it is difficult to justify superimposing on it emergency stocks which might be, say, only a 10-day supply.

Two other factors to consider in the stock-on-hand picture are quantities on hand for average use and quantities on hand for specific jobs. However, they are tied in closely with the two factors under rate of use; average use, usually based on historical records, and known unusual future requirements.

Ordering Point

Looking at the quantities on hand for average use and the average-use picture together, we get our first glimpse, in this study, of the ordering point. Probably on many purely routine, relatively unimportant items, consideration of these two points is as far as many of us go in determining the ordering point.

Average use must be modified by consideration of change in the rate of use caused by growth of the company.

Quantities on hand for specific jobs and unusual quantities known to be required in the future can have a very serious effect on the inventory, particularly in those cases where expected jobs have been delayed or speeded up. In either case there is involved a new look at the ordering point.

Several methods are used to determine when to have materials on hand for specific jobs. These are:

a. Predictions which can be obtained from annual budgets,
b. Specific bills of material for jobs,
c. Meetings with other departments,
d. An old friend—the grapevine.

Replenishment Time

The next basic factor is replenishment time. Quicker deliveries now available can enable us to reduce stock on hand.

An analysis of replenishment time can be broken down into several separate operations. First is *recording* the use. A second factor is then determining the quantities to order, based on the policy or procedures in use. Next is the preparing and approving of the requisition and sending it to Purchasing.

The time involved in buying in the Purchasing Department may vary from a few minutes to weeks or even months, depending on market and other factors. Probably the obtaining of competitive bids on a purchase involves the greatest length of time. The use of blanket orders or annual contracts is a method used to reduce the time element and may, in some cases, result in lower prices. For example, it is not uncommon to receive quotations these days on "book price" items well below that price. If the quantity is sufficiently attractive for delivery over a few months, or, even a year, quite substantial price reductions can result. From that point on considerable time is saved in the purchasing operation and the number of orders can be reduced.

Delivery Time

A fifth factor in replenishment time is the time required to obtain the material after the order has been placed. Generally, deliveries are now so short that in some cases the time involved in determining how much to buy and in the ordering process, is greater than is required to obtain delivery of the material. For many items, therefore, the major factor in replenishment time may be the buying company's internal process.

Replenishment time, as are most of the other factors, is a mutual problem of purchasing and stores, and each needs to be fully informed of the other's activities and have ready access to the information the other has.

Discussions between the departments are a vital necessity in order that each may perform its own job most efficiently; that is, in order that the company may obtain the best prices possible, have minimum inventory costs and material available when required.

Recently when inventories were excessive, unbalances on the high side were the rule. When inventory reduction policies took firm hold, the problem almost reversed itself and some unbalances became lack of stock of individual items. The problem became more acute as efforts were made to reduce *total* dollar value of inventory. This tended to result

in a rush of small orders which was dangerous from a rate of use point of view, and inefficient from the buying point of view.

Since material is of little use until finally disbursed, the time involved in the receiving operations for the first disbursement can sometimes be a major factor in replenishment time, particularly for those items on which the purchaser conducts tests before acceptance.

Stores Facilities

A fourth major inventory factor in determining when to buy is Stores facilities which can be broken down into:

a. Capacity,

b. Cost of carrying inventory,

c. Cost of receiving.

The extent of available storage facilities may have a great influence on determining, not only when to buy, but how much to buy.

The useful capacity of the Stores facilities is the basic consideration. The kind of material to be stored, together with the relative availability of inside and outside storage, is important. The problem is magnified when the system is expanding or when physically large items are involved, or, again, in periods of short supply where there is a tendency to over order.

Copper Supplies

Copper is a good example of the latter. Many of us were striving to obtain the necessary supplies in a rapidly rising market and, at the same time, we were faced with an unusually high consumption of copper products. One morning we awoke to find that the copper bubble had burst and it was pouring into our warehouses from all sides.

Many have faced the problem of having a good buy available but no economical space in which to store the material. Often we would prefer to place an order for one car per month rather than three cars every three months.

Most of the methods of allocating inventory costs to issues are arbitrary. Frequently the allocation is the same percentage for items costing a mill or two each, as those costing thousands of dollars each. The problem of relating these arbitrary cost allocations to actual costs as a basis for determining when to buy is difficult. It would seem desirable, where possible, to determine actual costs of requisitioning, buying, receiving, storing and disbursing in order to determine the most economical ordering quantity and frequency. The cost of receiving materials also can vary widely, depending on whether or not the special facilities are required, to what extent the materials are tested and whether or not material can go immediately to its storage or installation location or have an interim resting point.

The next major factor is the overall policy of the Stores Department. This has a direct effect on when to buy.

The total dollar level of inventory is subject to constant scrutiny. Whether inventory can be raised or should be lowered is studied from the company's financial position as well as the historical-use point of view. Principal factors affecting this policy are turnover of inventory, the growth trend of the company and the desire to minimize dollar investment in inventory or in Stores facilities. The size and type of storage facilities is under long term review, involving a study of trends in the size of inventory, location of facilities, type of facilities and whether they can be advantageously renovated or whether additional facilities are required. New methods for economizing on the use of facilities such as palletizing are under constant study.

Another overall Stores policy affecting the decision on when to buy is the decision on where to stock items. There is a gradually changing picture of which location is the most economical and effective for storing particular items. Good Stores planning in this respect can effectively minimize inventory. Utility problems are more critical in this regard than are manufacturing company problems, as our plant, that is, our system is scattered over many square miles instead of a few acres. A particular item in good supply in one Storeroom and in short supply in another can affect when to buy, particularly when costs of transportation between locations is considered.

Market and Other Factors

The second major division of the determination is Market and Other Factors.

Up to this point we have been considering essentially matters internal to the buying company. Although the market and other factors are perhaps first known or considered by the Purchasing Department, nevertheless, they are of considerable, if not equal, importance to the Stores people and are certainly of equal mutual interest for formulating overall policy.

Price Structure

Let's first look at the price structure factor. In utilities very few, if any, buy either futures or manufactured products on any long-term basis in anticipation of market strength. On the other hand, the holding off of buying in anticipation of market weakness is fairly common.

One of our correspondents did, last year, investigate the possibility of purchasing copper futures on the open market in order to cover a requirement of 500,000 lb needed in some high-voltage cable. On the surface this appeared attractive to them, since futures were lower than spot. However, there would be numerous difficulties for them in later disposing of the copper if they bought futures for 1950 delivery and these difficulties more than offset possible savings and the proposal was abandoned.

Utility buyers are giving careful consideration to overall market conditions, plus an appraisal of individual commodities as large requirements come along for any individual item.

Utility buyers are faced with buying conditions which do not always follow the general market pattern. For example, recently some motors increased in price and the following week transformer prices dropped. These inconsistencies are worth studying to determine, for example, why did transformers drop in price and what implications are there for future utility buying?

Quantity Discounts

One phase of the price structure consideration is that of quantity discounts. This, at first blush, sounds to be only a consideration of how much to buy, but when and how much cannot be separated. Purchasing has a real responsibility to keep the Stores Department informed of the discount picture and to work out joint decisions. Inventory charges can be larger than any quantity discounts that would be available. However, the market being what it is, quantity discounts may not be the greatest discount that can be obtained. Another method which almost amounts to a quantity discount is carload quantity buying. Another factor, that of supply or availability, is now good. For the present it would appear that in most cases the supply situation can be covered adequately in considering when to buy in the manner mentioned earlier under replenishment time; that is, delivery times can be readily determined and are reasonably the same month after month.

Competitive Situation

Another factor, the competitive situation, however, has almost completely reversed itself from a year or two ago. In recent years we have seen in a relatively short time almost the whole cycle of competition, from a seller's to buyer's market. During the seller's market, most competitors held the price line pretty closely, although there were some exceptions and during that period, buyers were endeavoring to stimulate competition. One method used by utilities was to bring in new suppliers who were anxious to get on the utilities' books.

The bettering of the supply situation with the resulting buyer's market, plus high utility inventories, caused a very rapid change to a really competitive market. It is noted that although there has been little downward change in price schedules, that prices in many lines are actually below published schedules due to competitive conditions. The utility copper market, for example, is weaker than electrolytic prices would indicate.

Utilities have been deferring ordering as long as possible and then ordering larger quantities for delivery over several months or even a year. This has created extra competition.

Occasionally when determining when to buy, it is found that specification changes are imminent. In such cases some like to purchase material in accordance with the new specifications as soon as possible, but at the same time have an adequate supply of either the old or the new on hand. "When to buy" the item may then depend a lot on the timing of the specification change.

When a substitute, such as aluminum for copper, is available and acceptable, all these factors as they apply to the substitute also require study before the decision is made.

Economic, Political Trends Studied

A continuing study of the economic and political trends is necessary if these factors are to be properly appraised. Periodicals, business services, vendors' salesmen, EEI and other groups are all sources of this information.

There are no doubt other factors, both tangible and intangible, involved in determining when to buy that have been overlooked in this study. Assuming this study is complete, we now have to resolve all the factors accumulated and are faced with the single decision of "when to buy." With all these factors in front of us, it may be that we wish we were salesmen instead.

For items that are repetitive in a purely routine fashion, an overall policy for ordering point and quantities may be reached after these points are considered. In other cases it may be that one of the points enumerated may be of such great significance that it alone will be the determining factor. Again in a rapidly changing market or in times of rapidly increasing or decreasing utility construction activity, the changing conditions themselves may dictate the necessity for frequent review of overall policy or individual items as the conditions change.

New Method of Inventory Control

There are other approaches to the problem and these may be in part applicable to utilities. Bruce D. Henderson, Manager of Purchasing, Stores and Shipping at Westinghouse at Sharon, Pa., has developed a method which is particularly applicable to his operation and probably to many manufacturing companies, and perhaps has application in utility repetitive buying operations.

Mr. Henderson states that we create inventories for only two purposes: one, to save money because it is cheaper to buy in bulk than for individual need, and, two, to have material on hand when the need arises. There are then only two actions that can be taken which determine how well inventories accomplish these objectives—

1. We can decide how much to buy,
2. We can decide when to buy it.

He developed a method for determining the most advantageous ordering of quantities and frequency. After instituting his program, he found that out-of-stock items were reduced to less than half and within less than six months the Purchasing Department was placing less than half as many orders. His method is to determine the size of the order and ordering frequency with reference to the cost of placing it and the cost of carrying the inventory.

Larger orders mean fewer orders but more inventory and in developing the optimum relationship between the two, he determined that the more money he spent per item per year the smaller and more frequent the purchase order should be in proportion. He then made a tabulation of annual expenditures in dollars for the item and opposite each the week's supply to order; for example, if the annual amount of the purchases for the item was $10,000 he orders a four-week supply on each order, but if the annual amount is only $4.00, he orders a 208-week supply.

Inventory Based on Extra Costs

These figures were based on their cost of placing an *extra* purchase order which is $3.50 and a 11 per cent per year carrying charge on *extra* stock. It is very interesting to note that it is based on the *extra* costs not on historical average cost per order or historical average inventory cost.

His first fear was that this practice would lead to excessive inventory but he soon found this groundless because, although most of the items were ordered in large quantities, most of the items did not represent a large per cent of the dollars in the inventory investment.

He found that without changing their inventory they decreased the number of items out of stock because, of course, they were reducing the number of orders placed.

He made an extensive study using the laws of probability or chance to determine the probabilities of running out of stock of any item. He believes that you should not only expect to have some items out of stock but that you must plan to have them out. He feels that he cannot carry the minimum inventory because of too many stock outs and he cannot afford to have no stock outs because that creates excessive inventory and costs. Their formulas were based on three variables to which probability laws were applied and these are:

1. Procurement time,
2. Size of withdrawals from stock,
3. Frequency of the withdrawal from stock.

An example of the thinking behind the probability laws used is if you use a given bolt only once in three months, you cannot get along with a two-month stock. Even worse, in this case, with such a low usage, the trend in use could change more rapidly than most methods, for determining the change in use could effectively result in action to change the stock of the item.

Conditions for Good Inventory Control

He summarizes the conditions necessary for good inventory control as:

1. Good inventory control means starting with a good use forecast;
2. The most economic ordering quantity must be determined with some precision;

(*Continued on page* 208)

Orchids for Mr. Ryan!

By Cal Lyon

From The Lyon's Tale, a column in *The Columbus, Ohio, Citizen,* April 23, 1950

FRANK J. RYAN came to Columbus from Cleveland the other day and after he had transacted his business with the state he and I went into a huddle at the University Club and for more than three hours discussed the state of the Union.

I've said before in this column that I consider Mr. Ryan the shrewdest intellect I've ever known. I said it for the first time when I found him, as state editor of the *Cleveland Press.*

25 Years With the Industry

He has come a long way. From managing editor of the Press, then, as now, Ohio's largest newspaper, he became editor-in-chief of the Newspaper Enterprise Association. A quarter of a century ago he went over to the Cleveland Electric Illuminating Co. where he now is assistant to the president and director of public relations.

Frank never saw the inside of a college, except on such occasions as he has visited them in recent years to deliver lectures to students and faculties. Maybe this fact has been a positive help to him, because his head is certainly not jammed with theories. He has a down-to-earth approach to present-day problems that fascinates me.

The words of wisdom that came from Frank at the University Club the other day were so stimulating that I'm passing some of them on to you folks, with the feeling that you will thank me for sharing them with you.

No need for quotation marks. The statements are all his!

Our Federal Government is already in more than 100 lines of business in a colossal way. It is the nation's largest banker, largest insurance concern, largest landlord. It has more than 1,100,000 tenants, and is building places to rent to tens of thousands more. It is the nation's largest dealer in farm products. It spent for farm products in 1948 nearly $2 billion, including $50,000,000 for peanuts.

The Government does not have to make a financial success of any business into which it ventures. That is, it does not have to make the business earn its own way to keep it going. It makes up its losses by increasing taxes. That's one reason why federal income taxes are so terribly high. Part of the money we pay in taxes will be used to make up the Government's losses in its socialistic business and industrial ventures.

The fact is the Federal Government has been taxing the earnings of certain business and industrial enterprises and using the money to subsidize its own unfair, unjust and ruinous competition with these self-same enterprises.

That is not the way to build a stronger and stronger national economy with production, wages and profits adequate to elevate the national standard of living, to support the national defense, and to maintain our leadership, prestige and power among the nations of the world.

The more our people know about the economic facts of life, the more they know about the benefits that our free economy has brought to them, the more they know about freedom of enterprise and the unequalled contribution of American business to the public interest —the more strongly they become opposed to encroaching Socialism.

Freedom Goes Before the Fall

In many nations — whose people fought and bled and died for freedom, the same as the American people—there today is no freedom as we regard freedom. There is no free economy, no freedom of enterprise; no freedom to work when you will, at what you will, wherever you will.

And, to face the facts, we in America do not have the same full measure of freedom we had only a few years ago. We now have in part a planned economy.

There is a vast difference between a planned economy and a free economy. The planned economy is a socialistic economy. Hitler and Mussolini had it; Stalin has it, Attlee has it.

Do the American people want it? Public opinion surveys show that the great majority don't want a planned economy; they don't want state socialism.

The trouble is, while a great majority of the people are against state socialism as a whole, they have accepted it in part —a part here, and a part there.

They have come to accept partial political and bureaucratic control of prices, wages and profits. They accept partial political and bureaucratic control of transportation, communication and other businesses. They accept Government invasion of many fields of business and industry.

Whether business and industry can regain the full freedom of enterprise they once had—with its incentive to initiative, invention, competition and production—depends on the new business statesmanship which the public relations profession has been helping to develop.

New Business Statesmanship

This new business statesmanship could well become the most influential economic development of the 20th century. It could eventually free business and industry from destructive political and bureaucratic control. It could put business into a stronger position to serve all parties at interest—including the public interest—more abundantly than ever before.

What is the most powerful force in America today? Is it religion or science or education? . . . Politics or government? . . . Wall Street or Washington? . . . Business management or organized labor? . . . The United Nations? . . . The cold war? . . . The H-bomb?

Is it any of these? The answer is no.

The most powerful force in America is PUBLIC OPINION.

Determining When to Buy

(*Continuesd from page* 207)

3. Measuring methods for availability must be used in connection with the usual measurements of turnover; that is, relationship between turnover and availability must be used;
4. The ordering point must be determined with proper consideration for the frequency of replacing stock, the frequency of issuing material and the procurement time.

Certainly the proper determination of "when to buy" with all its ramifications is a real challenge to all of us.

New Combined Boiler-Turbine-Generator Control Board for Centralized Control of Steam Electric Stations

By H. L. Lowe
Chief Electrical Engineer, Ebasco Services Inc.

A paper presented at the EEI Electrical Equipment Committee Meeting, Chicago, Ill., May 2, 1950

CENTRALIZED control has been employed in varying degrees in many steam-electric stations designed and constructed during the past decade. Individual control boards for boilers, turbines and electrical facilities, located in a central room or area, have been rather generally used.

Supplementary local control boards have been used for control of miscellaneous auxiliary equipment, such as coal handling to the bunkers and to storage, soot blowing, ash disposal, intake screens and air conditioning. In some cases, local boards, located near the equipment to be controlled, have also been used to duplicate control facilities in the central control room.

Relative merits of centralized control as compared with local or decentralized control and the extent to which it should be employed for specific plant designs, have been explored rather thoroughly in the recent past, as evidenced by articles in the technical press and by papers and discussions presented at recent technical meetings. The consensus seems to be that advantages of centralized control are sufficient to justify its use for new undertakings, particularly for the unit type of design with single boiler, single turbine arrangement.

New Combined Control Board

A new combined boiler-turbine-generator control board has been developed during the past two years, which requires panel length less than one-third that needed for the conventional, individual boiler gage, turbine gage and electrical control boards. This combined board, which contains essential instrumentation, signal alarms and control facilities for units up to 75,000-kw capacity or larger, is of the tunnel type with vertical panels front and rear and with supplementary bench board at the front.

Indicating instruments, gages, annunciators, control switches, levers and knobs are mounted on the front of the board. Recording instruments, relays, generator voltage regulator, watthour meters and automatic oscillograph, not essential for continuous viewing by the operator, are located on the rear panel.

A unit section is only 8 ft long, 7 ft 6 in. high, 6 ft wide between vertical panels and 7 ft 9 in. wide from front of bench to the rear panel face.

The control room area for a two-unit plant, employing combined control boards, is approximately one-half that needed for centralized control arranged on separate boiler, turbine and electrical boards. The control room shown in Fig. 1 for a new two-unit, 132,000-kw station, is arranged so that it may be enlarged in the future for addition of two more combined boards for the possible ultimate control of four large units from one central location.

The first combined control board was designed at the request of J. B. Thomas, president of Texas Electric Service Company, to be installed in the new 40,000-kw, two-unit, gas-fired, Morgan Creek Steam Electric Station at Colorado City, Texas.

Nine additional combined control boards, employing the same general arrangement of instrumentation and controls on the panels, are now in the design or fabrication stage. To date, combined boards for thirteen boiler-turbine-generating units, totaling more than 700,000-kw capacity in ten steam-electric stations have been authorized.

The substantial reduction in panel length of the combined board has been made possible by incorporating a few features which are not new but somewhat revolutionary for power plant application.

Compactness Achieved

Compactness was achieved in two ways:

1. As indicated previously, by locating all recording instruments, watt-

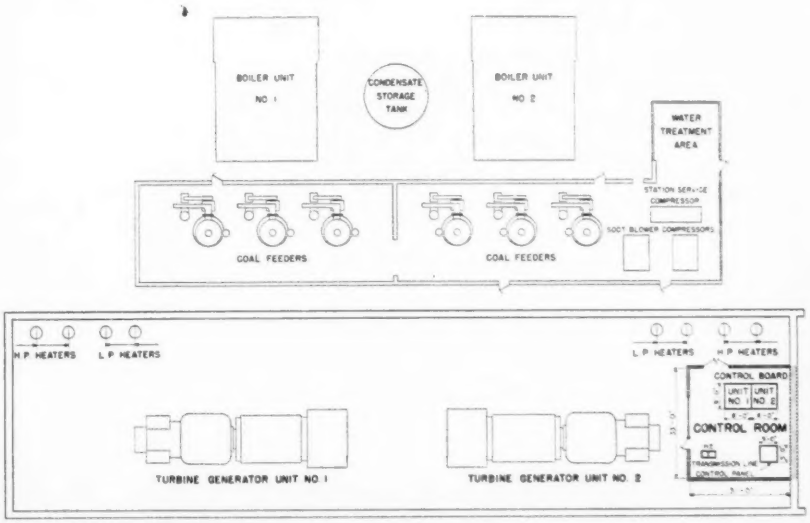

Fig. 1—Plan of Operating Floor of New 132,000-Kw, 2-Unit, Steam-Electric Station, Showing Combined Boiler-Turbine-Generator Control Boards With Separate Transmission Line Control Board

hour meters and relays on a rear panel, reserving all front space for essential indicating instruments, signal devices and controls.

2. By carefully selecting all front panel instruments and devices to secure minimum size consistent with required readability and ease of manipulation. Instruments, particularly for the mechanical part of the board, are of miniature proportions in comparison with conventional instruments commonly used on control boards. This was accomplished by use of the principle of re-transmission of indications, with low pressure, compressed air as a medium, controlled by transmitters integral with the the regular full-sized instruments on local boards.

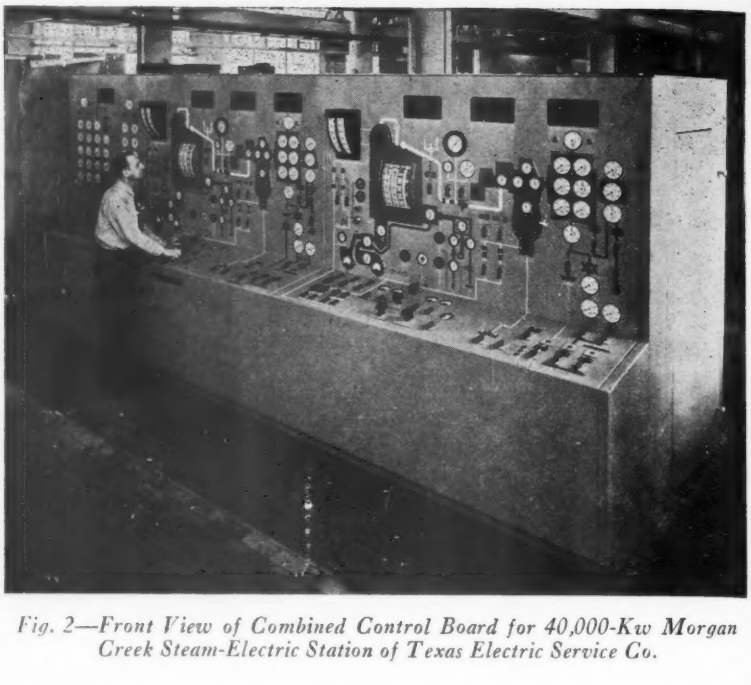

Fig. 2—Front View of Combined Control Board for 40,000-Kw Morgan Creek Steam-Electric Station of Texas Electric Service Co.

Advantages of New Control Board

Advantages of a control board providing this degree of compactness and centralization are fairly obvious.

Of considerable importance is the possibility afforded for saving in operating personnel. Except for the matter of starting up cold, the essential operation of the unit can be controlled entirely from the control board, and by one man if so desired. In starting up cold, the opening and closing of drains, the starting of miscellaneous motors, and several other local manual operations are required, but these are not necessarily simultaneous, and in general, can be handled by a man who at other times would handle various other routine plant duties.

The compactness of the board offers the advantage of making it possible for one man to have a comprehensive grasp of the entire plant performance. Meters and gages are easily read from one location and controls are within convenient reach. As a result, it is conceivable that one man could observe instruments and adjust controls for all normal operations in a two-unit plant. The extent to which this can be done for unusual or emergency conditions will depend upon capabilities of the operator and complexities of the plant and the electrical system to which it is connected.

In any event, related operations involving both steam and electrical facilities can be coordinated directly and carried out rapidly in the desired sequence. This is of greatest importance in an emergency.

The combined boiler-turbine-generator control board avoids piping of hot water, combustible gas and steam into the cubicle. This important feature represents a marked improvement over previous boiler and turbine instrumentation practices. Since the possibility of short circuits in control wiring caused by steam or hot water leaks is eliminated, it is unnecessary to provide barriers or isolating compartments as required for conventional gage boards.

Another advantage is the saving in size of room required to house the control equipment, representing substantial savings in structures, lighting, ventilation and air conditioning. Although additional costs for retransmission facilities are involved, the net saving in capital investment by the use of the combined board is substantial.

Use Mimic Arrangement

The instrumentation and controls are arranged in a functional manner to make operation more simple and convenient. Suitable representations of major items of equipment are shown in relief located on the board in a logical manner so that the power production process from fuel to generator output can be followed readily. Principal runs of piping and electrical buses and circuits are shown in mimic with distinctive colors used to facilitate interpretation of the indications, and to assist in obtaining speed and accuracy in manipulation of controls. This mimic arrangement is expected to make it less difficult to train and familiarize operators with equipment functions.

There are other incidental advantages some of which have been realized and others which seem to have promise. It is planned to explore these possibilities and the advantages which they may afford in the modification of operating procedures.

New Morgan Creek Control Board

The Morgan Creek control board, mentioned above, is a three-section cubicle, 19 ft in length, containing a transmission panel and two boiler-turbine-generator panels. Fig. 2 shows a front view of the board with two 8-ft boiler-turbine-generator panels on the right, and a 3-ft transmission section on the left. The board incorporates essential controls for two 220,000-lb-per-hour gas-fired steam generators, two 20,000-kw turbine generators with associated auxiliaries, and for the high voltage switchyard containing two 69-kv transmission line terminals, two 138-kv transmission line terminals and a 69- to 138-kv tie transformer.

Fig. 3 is a photograph of the rear of the Morgan Creek board, showing recording instruments, relays, watthour meters, generator voltage regulators, and space for mounting an automatic oscillograph.

Fig. 4 is an interior view of the board from the transmission-line control

panel end showing wireways, terminal blocks, instrument connections, and other facilities on the back of the front panel.

Fig. 5 is a close-up front view of the right section of the Morgan Creek control board showing instruments, gages, annunciators and controls for the 20,000-kw Unit No. 2. Controls and instrumentation are arranged from left to right in eight major zones or groupings which include (1) boiler feedwater system, (2) air heater and draft fan system, (3) boiler and furnace (4) fuel supply and burners, (5) steam piping and controls (6) steam turbine and auxiliaries, (7) condenser and auxiliaries and (8) generator, exciter and electrical auxiliary supply.

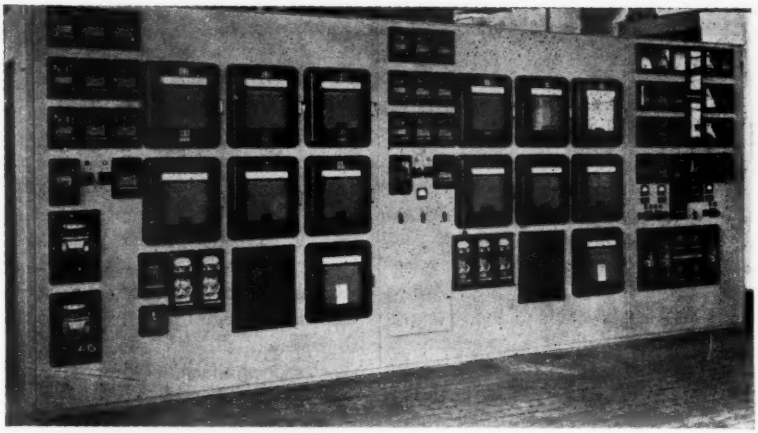

Fig. 3—Rear View of Combined Control Board for 40,000-Kw Morgan Creek Steam-Electric Station

Indicating Instruments

Indicating instruments associated with the generator, exciter, and other electrical facilities are of the semi-flush type, 4¼ in. square, with 270 degree scales, white dials, 3½ in. in diameter, provided with black numerals and lettering.

Low-pressure quantities for air flow, draft pressures, etc., are transmitted directly to indicating instruments on the front panel in the conventional manner. Gages for combustion control are airplane speed indicators with special dials but without the altitude compensating feature. Instruments for indicating boiler feed, steam flow, drum level, furnace draft and gas flow are standard vertical bellows-operated draft gages. All except furnace draft are actuated by compressed air retransmission. Two completely separate drum-level indicators are provided for safety.

Higher pressure gages, mounted on the front of the board, are of the Bourdon-tube type actuated by compressed air retransmitted at pressures from 4 to 16 psi with 3 or 6 in. flush-mounted dials.

Remote manual control devices for use with combustion control and fuel control systems are identical with those customarily used except for special switch handles.

A new style switch handle, midway between finger and pistol-grip types, was designed to point clearly to position index. This handle mounts closely to the bench or panel surface to avoid obstruction of sight to nameplates and to prevent accidental movement by the operator when reaching for another switch. In order to conserve space, the switch escutcheons, made of photographic plastic, contain the nameplate markings.

To represent valve positions, rectangular signal lamps are mounted on the mimic piping, one parallel to, and one at right angles to the piping so that both color and position will indicate whether a piece of equipment is in use or not. Green lights at right angles to the piping indicate equipment out of service, while red lights parallel to the piping indicate equipment in use. Signal lamps for the electrical circuits are of the ordinary low-voltage, low-burden

(*Continued on page* 215)

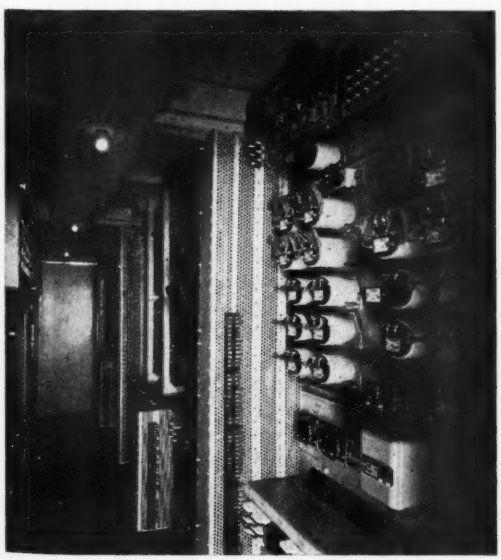

Fig. 4—Interior View of Combined Control Board Showing Back of Front Panels at Right for 40,000-Kw Morgan Creek Station

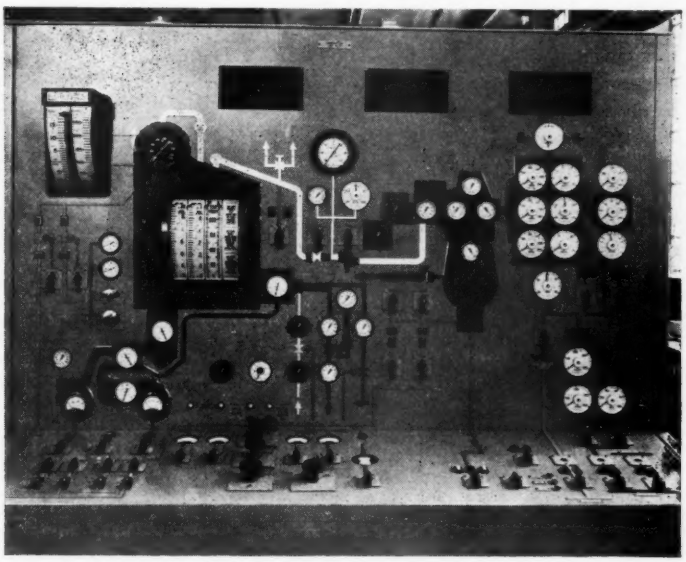

Fig. 5—Front View of Right Section of Morgan Creek Combined Control Board, Showing Instruments, Gages, Annunciators and Controls for 20,000-Kw Unit No. 2

Electrical Equipment Committee Meeting

B. Van Ness, Jr., *Chairman*

THE 51st Meeting of the Electrical Equipment Committee was held at the Edgewater Beach Hotel in Chicago on May 2 and 3 with some 75 members and guests in attendance. On May 1 the committee members were the guests of the Allis-Chalmers Company in Milwaukee, where the morning was devoted to technical presentations on recent advances in the design of electrical equipment, followed in the afternoon by a visit to the Allis-Chalmers plant.

Closed Session

The first day of the meeting in Chicago was devoted entirely to the closed session, attendance at which is limited to members of the committee and invited utility company guests. A. M. DeBellis, the new sponsor for the subject of Apparatus Troubles and Oil Fires presented a summary of the report for the latest six-month period. A total of 155 cases was included, of which 81 were classified as being of major interest. Of these, generators (both hydro and turbo) accounted for 12 cases, induction motors and oil circuit breakers, 11 cases each, and transformers over 500 kva represented 10 cases. A number of specific instances of trouble were presented in detail for the information of the committee.

R. W. Wilbraham, Chairman of the Joint Subcommittee of the Electrical Equipment and Prime Movers Committees on bearings, reviewed the highlights of a comprehensive report previously distributed to the committee covering experience and application preference in regard to sleeve and ball bearings. The committee endorsed the report and requested the subcommittee to carry forward its program on this project.

Recent developments in the use of inhibitors in transformer oil were reviewed by R. M. Pennypacker. He called attention to research work that had been carried out in this field and discussed a number of factors that require consideration when making a study as to the desirability of using such inhibitors. In the discussion of his paper several members reported preliminary experience.

Open Session

At the start of the Open Session Wednesday morning, W. F. Wetmore reported that work is continuing actively on the revision of the Rotating Machinery standard by ASA Sectional Committee C50. To expedite the revision, a subcommittee has been set up to consider the questions pertaining to synchronous machines and considerable progress has been made on several items, including the temperature-rise limits.

The attention of the committee was called by Harris Barber to several items in the new NEMA standard for Power Switchgear Assemblies. Regret was expressed at the conflict between this standard and the AIEE standard in the matter of temperature rise, since the point in question has been under review by AIEE for some time.

N. C. Pearcy reported that the proposed Power Station Electrical Data Sheet had been revised following the comments received after the last meeting and should be ready for distribution in the near future.

A description of the new West Springfield Station of the Western Massachusetts Electric Company was presented by J. W. Bennett. Simplicity of design and economy in the use of equipment were important considerations in the application of the ring bus. However this arrangement was decided upon only after a complete analysis of system operation and coordination of all production and distribution facilities. Another feature of the station is the use of power center substations for supply to station auxiliaries which promoted overall economy and reliability.

A novel combined boiler-turbine-generator control board for centralized control of steam electric stations was described by H. L. Lowe. This is reported in detail elsewhere in this issue of the BULLETIN.

A. V. DeBeech for the Foreign Practice Division called attention to a number of items of interest in the foreign press.

Recent work of the Control Battery Subcommittee was reported by W. C. Bowen. This subcommittee has the following matters under consideration: battery specifications, initial capacity, acceptance tests, size of batteries required for emergency lights, equalizing practice, charging equipment and discharge tests.

Employee Training

R. C. Buell described the general program for improved employee training through supervisory development that had been instituted by the Pennsylvania Power & Light Company. This featured the conference method, with the various conference groups composed of people of all levels of supervision and from all the departments. J. S. Viehe described the method of organization, the subjects of the various conferences, and some of the results after only a little more than one year's operation. In the discussion following the presentations it was brought out that a number of the companies were making increasing use of the conference method of approach to the training problem, in various degrees —some on a department basis and others on a more company-wide approach.

Transmission and Distribution Committee Meeting

By J. E. McCormack, *Chairman*

THE SPRING Meeting of the Transmission and Distribution Committee was held on May 25 and 26 at the Cosmopolitan Hotel in Denver with 130 members and guests in attendance.

Standards and Specifications

The Standards and Specifications Group, sponsored by W. E. Losie, reviewed subcommittee activities.

L. J. Jacobi reported a favorable ballot on the proposed specification for Southern Pine crossarms. Work has been started on a specification for heavy duty crossarms. A specification covering full-length pressure treatment of poles and recommended practices for the inspection of standing full-length treated poles also are contemplated.

R. M. Havourd reported that final editing of proposed EEI-NEMA specifications for suspension, spool and strain insulators is about completed. Continued

progress is being made on proposed specifications for high- and low-voltage pin and high-voltage post insulators.

R. J. Palmer stated that EEI-NEMA street lighting equipment specifications for filament lamps, photometric tests for luminaires, voltage ratings, pendent luminaire mounting and series sockets and receptacles are ready for publication. Work on six other specifications is progressing and an additional four are planned.

E. K. Karcher reported further progress on four proposed line hardware specifications. A separate specification covering inspection and rejection of all line hardware items is planned and a survey of the extent of the use of published line hardware specifications is contemplated.

A report from W. L. Vest indicated that difficulties in establishing values for the 10-second point of the proposed EEI-NEMA standard characteristics for distribution fuse links have been resolved and that the entire standard is about ready for ballot.

Safe Design, Construction and Operation

The session on safe design, construction and operation featured discussion of training for safety. C. E. Bathe, sponsor of this committee activity told how increased emphasis on supervisor training produced a 4-to-1 reduction in the frequency of accidents in the transmission and distribution department of his company in the last 18 months. This training, which covers all levels of supervision, also has shown that the accident record is a good index of general operating efficiency.

G. S. Van Antwerp described the training program of the Philadelphia Electric Company emphasizing the importance of carefully training new men in order to establish habit patterns of safe procedures as well as the more difficult follow-up of work practices in the field.

L. Phillips presented a paper by J. G. Charest outlining the training program of the Pennsylvania Power and Light Company reiterating the points emphasized by Mr. Van Antwerp and giving details of numerous follow-up procedures used in the field.

Overhead Group

The Overhead Group, sponsored by L. G. Smith, featured discussion of corrosion resistant hardware.

E. W. Oesterreich presented an analysis of the effect of the life of hardware items of overhead pole line structures on overall annual costs. This indicated that although the cost of the hardware items is relatively low, the life of these items, by determining the degree of coordination of design, the number of replacements to be made and the corresponding labor and drayage expenditures, control the annual cost of the structure. It was concluded that structures with 100 per cent coordination of design have lower average annual costs than any other structure designed for a lower degree of coordination with the same pole life expectancy.

Following this presentation Messrs. Oesterreich, C. E. Baugh, R. M. Havourd, R. H. Earle, C. H. Jackman, A. H. Stanley, C. C. Warne, Jr., and W. H. Zillger participated in a panel discussion on corrosion resistant hardware conducted by E. V. Sayles. Manufacturer's representatives pointed out that the biggest problem in producing corrosion resistant hardware is to obtain sufficient volume for economical production.

A paper by W. J. and J. D. Piper described an electropotential survey of the extent of corrosion on underground parts of The Detroit Edison Company's galvanized steel transmission line towers. Advantages of this method are its speed and indication of the overall condition of the entire underground portion of the tower. Approximately half of the towers in the ground 20 to 30 years still are adequately protected although many at station ends of lines are not. Magnesium anodes installed at such locations were found incapable of protecting footings unless the overhead ground wire is insulated from the station structure.

C. V. Waddington noted difficulty in determining reasons for failure of automatic line splices now widely used on distribution lines. Discussion indicated that improper application and installation are the primary sources of trouble. Several members considered that the use of grease, pre-stressed conductors and four-jaw devices also is desirable.

Underground Group

The Underground Group, sponsored by J. A. Pulsford, featured description and discussion of the proposed EEI-NEMA standards for conventional subway-type transformers. M. W. Ghen described important features of the proposed standard which includes welded covers, bolted handhole covers with optional covers for welding, welded wiping sleeves and porcelain secondary bushings. R. D. Rung of the Westinghouse Electric Corporation, presented slides showing detailed features of the proposed standard and a mock-up model of the complete transformer. Messrs. Ghen and Rung then presented movies showing removal of welded covers both by welding torch and by chipping.

J. L. Giger led a discussion of western practices in residential underground construction. C. E. Baugh reported that systems in his area utilize overhead-type transformers mounted on concrete boxes with sheet steel housing, single conductor primary and secondary mains in non-metallic conduits and pre-cast concrete boxes for connecting services. Installed cost is several times that for overhead construction although maintenance during the first few years of operation has been comparable to that for overhead where conduit has been used.

A report from M. T. Crawford described a system using 42-inch sewer tiles with steel plate covers for transformer vaults. Conduit is used for primaries but no secondary mains are used, services radiating directly from transformer vaults.

J. A. Pulsford reported that the AEIC-EEI research project on pipe-type cable has established that losses in shield and skid-wires are directly proportional to the conductance of the shield and skid-wire circuit and that the steel pipe contributes a major portion of a-c loss. These indicate the desirability of using higher resistivity materials for these items.

Final data on 1948 cable operations, presented by J. J. Pokorny, showed a cable failure rate of 6.5 per 100 cable miles as compared with 5.6 in 1947. Most of this increase was caused by an increase of failures due to mechanical damage.

A preliminary summary of network operations for the period 1947-1949 inclusive presented by J.A. Pulsford, indicated a considerable increase in the number of network outages and transformer explosions as compared with the preceding 3-year period.

L. F. Hickernell of the Anaconda Wire & Cable Co. described a new mechanically applied termination for shielded non-metallic sheathed aerial cable which eliminates hand taping while providing voltage stress relief and facility for grounding the shielding tape without the use of solder. He showed a movie demonstrating the speed of application.

General Engineering Group

The General Engineering Group, sponsored by J. W. Anderson covered numerous subjects.

(*Continued on page* 216)

PERSONALS

Consolidated Edison Company of New York, Inc., has announced that its board of trustees has elected three new vice presidents, DR. JOHN J. WITTMER, EARL L. GRIFFITH and CHARLES B. DELAFIELD.

Dr. Wittmer, who has been an assistant vice president since 1946, has been identified throughout his Con Edison career with various phases of employee relations, including the supervision of the personnel and medical departments. Mr. Griffith, who has been an assistant vice president for the past decade, directs the company's extensive construction, maintenance and shops program. Mr. Delafield's responsibilities, which have included corporate finance and advertising matters, were recently extended to include the company's commercial relations department.

Dr. John J. Wittmer has been with the Consolidated Edison system since 1924, when he joined Brooklyn Edison Company as a staff physician. He was appointed medical director in 1937 and added the duties of personnel director in 1939. He became an assistant vice president, industrial relations, in 1946.

He was educated at Fordham University, University of Chicago and Long Island College of Medicine. He served in the Army medical corps during World War I and later was lieutenant commander in the U. S. Naval Reserve. During the last war, Dr. Wittmer was appointed consultant to the U. S. Secretary of State.

Mr. Griffith, immediately after graduating from Stevens Institute of Technology in 1923, was employed by Consolidated Gas, a predecessor company, as an inspector in its construction drafting bureau. Three years later he was made a field engineer in the construction department.

Following the merger of various gas and electric companies into Consolidated Edison, he became maintenance and construction engineer. Mr. Griffith was named engineer of gas maintenance construction in 1938 and he was elected an assistant vice president, construction and shops, in 1940.

Mr. Delafield joined Consolidated Edison in 1946 as assistant to Ralph H. Tapscott, who was then president. He was elected assistant vice president, public relations, in June, 1948, and became assistant to the chairman of the board in February, 1949, when Mr. Tapscott was elected to that position.

He received his academic education at St. Bernard's School in New York, St. Paul's School at Concord, N. H., and Harvard University, and then became associated with Coffin and Burr, investment bankers, in both Boston and New York. From 1935 to 1942 he was with Kidder, Peabody and Co. in New York.

In 1942 he joined Illinois Power Co. as assistant to the president and later was elected vice president.

Mr. Delafield is a director of the Edison Electric Institute and a member of the Institute's Executive Committee.

RAYMOND A. GIBSON has been elected a vice president of Hartford Electric Light Co., with the retirement of RALPH D. CUTLER after 42 years of service.

Mr. Gibson joined the Hartford Company's sales department in 1923. Later he served as editor of the company's employee publication, "The Illuminator," as advertising manager, assistant commercial manager, and as assistant to several vice presidents. He was named sales manager in 1945.

Mr. Cutler, a member of the executive committee of the Association of Edison Illuminating Companies, has been a vice president since 1929. He joined the company in 1907 and was sales manager before his election as vice president. Mr. Cutler will continue as a director of the company.

CLAY C. BOSWELL has been elected vice president and assistant general manager of Minnesota Power & Light Company, Duluth, Minn.

FRANKLIN S. RICE has been appointed chief engineer and HUBBELL CARPENTER assistant chief engineer.

Mr. Boswell graduated from the University of Missouri and in 1915 entered the employ of Utah Power & Light Company, Salt Lake City, as a substation and power plant operator and maintenance man. After service in France in the First World War, he returned to Utah and became Assistant to the Commercial Manager. In 1923 he went to New York with Electric Bond & Share Company as assistant to one of that company's operating sponsors. In 1929 he came to Duluth as assistant chief engineer of Minnesota Power & Light Company, and in 1934 he became chief engineer.

In 1936 Mr. Boswell was elected director of the company and in September 1940 vice president—still continuing as chief engineer.

Mr. Rice is a graduate of Lowell Institute of Boston, and after employment by the General Electric Company in Schenectady, he came to Duluth in 1916 as operating engineer of Great Northern Power Company, one of Minnesota Power & Light Company's predecessors. When Minnesota Power & Light Company was formed in 1923 he became its electrical engineer and in 1934 was appointed assistant chief engineer.

Mr. Carpenter is a graduate of the University of Idaho and for a while was employed by Idaho Power Company. He was engaged on a number of important construction jobs in California, Idaho, Montana, Oklahoma and Texas and was resident engineer on several of these for Ebasco Services Inc., of New York. He became associated with Minnesota Power & Light Company in 1940, and since then has been superintendent of special construction on several power plant construction jobs.

SAMUEL M. SHARP, chief engineer of Southwestern Gas & Electric Co., has been elected a vice president.

Mr. Sharp joined Southwestern in 1932 as Louisiana division engineer. He was named electrical superintendent in 1935 and chief engineer in 1941.

He started his career in 1923 in the Westinghouse Electric Corp. student engineering and shop course. After a year with Westinghouse, Mr. Sharp spent three years with East St. Louis (Ill.) Light & Power Co., then joined a Southwestern associate, Central and Southwest Utilities Co., in Dallas. With the last named company he did design, engineering and construction work.

W. J. AICKLEN, vice president and division manager of the Galveston division of Houston Lighting and Power Co. for the past 19 years, has been elected assistant general manager. Mr. Aicklen joined the company in 1927 as general commercial superintendent and was made a director ten years ago. Before going to Houston, Mr. Aicklen was president and general manager of Consumers Electric Light & Power Co., New Orleans, La.

HAROLD E. CODY has been appointed assistant general superintendent of lines of The Cleveland Electric Illuminating

Co. ALBERT W. REECE will succeed Mr. Cody as superintendent of the company's eastern district, with headquarters in Ashtabula, Ohio. Mr. Cody joined the company 24 years ago as a groundman in the lines department. He has held his present post since July, 1943. Mr. Reece has been with the company since 1945, first in Cleveland and later in the Ashtabula office as assistant superintendent.

WALTER T. LUCKING has joined the Arizona Edison Co. as assistant to the president, and will supervise the personnel, budget and rates, new business, safety, advertising, and publicity departments. He was formerly project manager of construction for Ohio Public Service Co.

EDWARD N. STRAIT has retired as manager of the rate and research section of Pioneer Service & Engineering Co. Mr. Strait, who organized the section in 1916 for a predecessor company of Pioneer, has also been with the Railroad Commission of Wisconsin.

Mr. Strait has been a member of the Rate Research Committee of the Institute since 1927, serving as vice chairman of the committee from 1943 to 1945 and as chairman from 1946 to 1948. He has also headed the rate committee of the American Gas Association.

ERWIN F. MATH has joined the Iowa-Illinois Gas & Electric Co., Davenport, Ia., as director of purchases. He succeeds FRANK H. HUGHES, who was director of purchases for the Iowa company and for United Light and Railways Service Co. since 1947. Mr. Math was formerly assistant purchasing agent of J. I. Case Co., Bettendorf, Iowa.

W. R. WEISE, superintendent of planning and engineering in the electric distribution department of The Cincinnati Gas and Electric Co. since 1948, has been named assistant manager of the department. H. W. GRATE, who has been superintendent of distribution engineering, will succeed Mr. Weise and J. A. KELLER, associate engineer in electric distribution, will take over Mr. Grate's duties. Mr. Weise and Mr. Keller have both been with the company for about 25 years, and Mr. Grate for 21 years.

A. F. RANDOLPH has been appointed safety engineer, electric operating department, Public Service Electric and Gas Company, succeeding W. R. SMITH, who has retired.

Mr. Randolph went to Public Service from Rutgers University in 1911. Starting as a timekeeper and then becoming a foreman, engaged in the construction of electric conduits and manholes, he performed various duties and filled positions with increasing responsibility in underground construction work until he headed up all of this work performed by the company.

In 1935, Mr. Randolph was made underground construction engineer, and in 1943, he went to the company's central division as assistant to division superintendent. In 1947 he was appointed assistant to chief engineer, electric engineering department.

DONALD M. QUICK has been appointed assistant to the chief engineer of the electric engineering department of Public Service Electric & Gas Co. Mr. Quick joined Public Service as a cadet engineer in 1923. In 1937 he was assigned to the electrical division of the electric engineering department, where he worked on design of generating stations and substations. He was made senior engineer in 1948.

Some Current Collection Practices and Their Effect on Customer Relations

(*Continued from page* 204)

"It was in 1932," he continued, "with the depression at its worst and our people around here were suffering. I was working at ..... but not full time—and with my daughters in school and trying to help others, I went away behind on my light bill.

"Finally your collector came and I expected him to cut me off, since many of my friends had had their service cut. But instead of talking about cutting the service, he talked about how to keep it on. And so, through the patience of your collector, I paid; a dollar or two at a time until I caught up.

"I now pay my bills at the bank and don't see him any more. But I still remember his name; Tom .....

"Since then, I've put my two daughters through college and soon I'll have these two flats paid for.

"The Lord has been good to me these past 17 years and I hope He has been good to that collector. I've asked Him to be many times in my prayers."

The committee wants to thank the companies who were so cooperative in furnishing the material for this report. If anybody wants additional information about the questionnaire, we will be glad to furnish it if it is available. Please communicate with Harry Hahn, c/o The Ohio Fuel Gas Company, 99 North Front Street, Columbus 15, Ohio, or Fred Flom, c/o The Detroit Edison Company, 2000 Second Avenue, Detroit 26, Michigan.

New Combined Boiler-Turbine-Generator Control Board For Centralized Control of Steam Electric Stations

(*Continued from page* 211)

type with series resistor mounting and round glass lenses.

Other Features

Certain savings in engineering and manufacture of these combined boards have been made possible by a relatively high degree of standardization in the basic design.

Except for a few improvements which have been incorporated in later boards, as a result of availability of newly developed instruments and some modifications in panel-board layouts, all boards will be basically identical.

Space has been allocated on the combined boards for reasonably expectable variations in instrumentation and controls to accommodate initially installed power plant equipment of various types and manufacture and for future additions.

Sufficient panel space is provided to accommodate combustion control facilities of any type or manufacture.

Arrangement of control boards and accessory panels in the control room will be somewhat dependent upon the amount of electrical facilities to be controlled from the central control room. In the case of the Morgan Creek Station, all control boards are in line. In other situations, the transmission line panels are mounted separately from the combined boiler-turbine-generator boards, but facing them. In general, any additional facilities, such as totalizing load recorders, telemetering equipment and load control equipment, are installed on or adjacent to the trans-

mission line control board, which is usually of the tunnel type with vertical front and rear panels.

Equipment housed in cabinets, such as carrier current transmitter-receivers, amplifiers, telephone equipment, etc., are usually placed against one of the walls of the control room.

Telephone communication, generally supplemented by a public address or loudspeaker system, is provided between the control room and strategic locations throughout the plant.

It is not expected that the combined board will be employed to any great extent in existing plants where the pattern is already established. It should show substantial advantages when applied to the more complicated heat cycles, where coordination of the operation of individual boards would be more difficult.

Transmission and Distribution Committee Meeting

(*Continued from page* 213)

H. E. Jung described results of a voltage complaint survey as related to EEI-NEMA Preferred Voltage Ratings for A-C Systems and Equipment. About 70 per cent of complaints are low-voltage complaints and less than half of these are found to be below the favorable zone established in the EEI-NEMA report. Only 6 per cent of high-voltage complaints are justified on this basis. Most frequent low-voltage complaints in urban areas are in connection with unsatisfactory operation of television sets. Several other members confirmed increasing numbers of complaints from television receiver owners.

J. W. Anderson reported progress in the development of EEI-NEMA starting current rules for polyphase motors.

M. G. Graff of the General Electric Company outlined the history of the development of mercury vapor street lighting and described details of luminaires now available for areas where high levels of illumination are required. M. H. Powell described the history of mercury vapor street lighting in Denver which was initiated in 1937. About 3600 lights are now in service. Original units included 200-watt incandescent lamps but these were ultimately eliminated without any adverse criticism regarding color.

A report from J. W. Young outlined experience with mercury vapor lamps in New England beginning in 1936 and now extending to 3500 lamps in 31 communities. J. C. Livesay described more recent installations in several small cities in Colorado. Comments submitted by W. H. Johnson indicated that despite the greater number of lumens per watt provided by mercury vapor lamps, full consideration of the cost to operate the back-up system and a proper comparison of light patterns show incandescent lamps to be more economical.

There was a general discussion of the sharing of costs for joint use of poles for power and telephone circuits.

A report from W. C. Phillips noted that the National Committee for Utilities Radio has completed a guide for the preparation of a definite operating procedure for mobile radio systems. FCC regulations require such a procedure for each operating system. Delays in processing applications for required frequency modifications are being reduced and the present problem is obtaining delivery on crystals and other conversion parts before the conversion deadline of July 1.

A session on system troubles included reports of damage from ice storms in Clinton, Iowa, and Texas, windstorms in Wisconsin and New York, explosion of network switch, and a seven-inch snowstorm after trees were in full leaf which occurred in the Denver area during the meeting.

A gadget show conducted by R. G. Atkinson included exhibits of numerous devices and small equipment developed by various operation companies for use on overhead and low-cost underground distribution lines.

CONVENTIONS AND MEETINGS

1950

JUNE

5-7 Edison Electric Institute, Annual Meeting, Atlantic City, N. J.
12-16 National Association of Electrical Distributors, Annual Convention, Atlantic City, N. J.
12-16 American Institute of Electrical Engineers, Summer Meeting, Pasadena, Calif.
15-19 Canadian Electrical Association, 60th Annual Convention, Manoir Richelieu, Murray Bay, Que., Canada.
19-20 Pennsylvania Electric Association, Electrical Equipment Committee, Abraham Lincoln Hotel, Reading, Pa.
19-21 American Society of Heating & Ventilating Engineers, Semi-annual Meeting, Muskoka Lakes, Ontario, Can.
19-23 American Society of Mechanical Engineers, Semi-Annual Meeting, St. Louis, Mo.
26-30 American Society for Testing Materials, Atlantic City, N. J.
29-July 8 International Conference on Large Electric Systems (CIGRE), Paris, France.

JULY

10-12 World Power Conference, London, England.

AUGUST

21-25 Illuminating Engineering Society National Technical Conference, Hotel Huntington, Pasadena, Calif.

SEPTEMBER

25-27 American Trade Association Executives Annual Meeting, Somerset Hotel, Boston, Mass.
27-29 Canadian Electrical Manufacturers Association Annual Meeting, General Brock Hotel, Niagara Falls, Ontario, Can.

OCTOBER

2-6 American Gas Association Annual Convention, Atlantic City, N. J.
3-5 American Institute of Electrical Engineers, District No. 2, Baltimore, Md.
11-14 International Association of Electrical Leagues, 15th Annual Conference, Copley Plaza Hotel, Boston, Mass.
16-20 38th National Safety Congress, Chicago, Ill.
17-21 National Electrical Contractors Association Annual Convention, Biltmore Hotel, Los Angeles, Calif.
23-27 American Institute of Electrical Engineers, Fall General Meeting, Skirvin Hotel, Oklahoma City, Okla.

NOVEMBER

8-10 Wisconsin Utilities Association, Electric and Gas Section, Schroeder Hotel, Milwaukee, Wisc.
13-16 National Electrical Manufacturers Association, Chalfonte-Haddon Hall, Atlantic City, N. J.
27-29 American Standards Association Annual Meeting, Waldorf-Astoria Hotel, New York, N. Y.

EDISON ELECTRIC INSTITUTE OFFICERS AND COMMITTEES

OFFICERS

ELMER L. LINDSETH, *President*.....The Cleveland Electric Illuminating Co., Cleveland, Ohio
L. V. SUTTON, *Vice-President*.....Carolina Power & Light Co., Raleigh, N. C.
H. S. BENNION, *Vice-President and Managing Director*...420 Lexington Avenue, New York, N. Y.
K. B. CRUMB, *Treasurer*.....American Gas & Electric Service Corp., New York N. Y.
MAE B. WOODS, *Secretary*.....420 Lexington Avenue, New York, N. Y.

BOARD OF DIRECTORS

(Terms Expiring 1950)

E. R. ACKER.....Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y.
AUSTIN D. BARNEY.....The Hartford Electric Light Co., Hartford, Conn.
REX I. BROWN.....Mississippi Power & Light Co., Jackson, Miss.
E. W. DOEBLER.....Long Island Lighting Co., Mineola, N. Y.
L. M. KLAUBER.....San Diego Gas & Electric Co., San Diego, Calif.
J. A. LONGLEY.....Central Illinois Light Co., Peoria, Ill.
H. B. MUNSELL.....Kansas City Power & Light Co., Kansas City, Mo.
R. S. NELSON.....Gulf States Utilities Co., Beaumont, Texas
C. E. OAKES.....Pennsylvania Power & Light Co., Allentown, Pa.
B. F. PICKARD.....Interstate Power Co., Dubuque, Iowa
McGREGOR SMITH.....Florida Power & Light Co., Miami, Fla.
A. C. SPURR.....Monongahela Power Co., Fairmont, W. Va.
L. V. SUTTON.....Carolina Power & Light Co., Raleigh, N. C.
O. TITUS.....Metropolitan Edison Co., Reading, Pa.

(Terms Expiring 1951)

J. M. BARRY.....Alabama Power Co., Birmingham, Ala.
GEORGE M. GADSBY.....Utah Power and Light Co., Salt Lake City, Utah
D. E. KARN.....Consumers Power Co., Jackson, Mich.
J. E. LOISEAU.....Public Service Co. of Colorado, Denver, Colo.
D. C. LUCE.....Public Service Electric and Gas Co., Newark, N. J.
PAUL B. McKEE.....Pacific Power and Light Co., Portland, Ore.
C. B. McMANUS.....Georgia Power Co., Atlanta, Ga.
S. C. McMEEKIN.....South Carolina Electric & Gas Co., Columbia, S. C.
GROVER C. NEFF.....Wisconsin Power and Light Co., Madison, Wis.
P. H. POWERS.....West Penn Power Co., Pittsburgh, Pa.
HAROLD QUINTON.....Southern California Edison Co., Los Angeles, Calif.
J. B. THOMAS.....Texas Electric Service Co., Ft. Worth, Texas
JOHN T. WARD.....Boston Edison Co., Boston, Mass.
W. F. WYMAN.....Central Maine Power Co., Augusta, Maine

(Terms Expiring 1952)

W. C. BECKJORD.....The Cincinnati Gas & Electric Co., Cincinnati, Ohio
H. B. BRYANS.....Philadelphia Electric Co., Philadelphia, Pa.
H. C. CUMMINS.....Northern States Power Co., Minneapolis, Minn.
CHAS. B. DELAFIELD.....Consolidated Edison Co. of New York, Inc., New York, N. Y.
W. G. B. EULER.....Pacific Gas and Electric Co., San Francisco, Calif.
F. C. KELLOGG.....Pioneer Service and Engineering Co., Chicago, Ill.
C. E. KOHLHEPP.....Wisconsin Public Service Corp., Milwaukee, Wis.
P. H. McCANCE.....Duquesne Light Co., Pittsburgh, Pa.
R. E. MOODY.....Union Electric Company of Missouri, St. Louis, Mo.
IRWIN L. MOORE.....New England Electric System, Boston, Mass.
A. T. O'NEILL.....Niagara Mohawk Power Corp., Buffalo, N. Y.
HAROLD TURNER.....The Ohio Power Co., Canton, Ohio
G. W. VAN DERZEE.....Wisconsin Electric Power Co., Milwaukee, Wis.
FRANK M. WILKES.....Southwestern Gas & Electric Co., Shreveport, La.

Executive Committee

The Executive Committee consists of the following members of the Board of Directors: Austin D. Barney, W. C. Beckjord, H. B. Bryans, Chas. B. Delafield, P. H. McCance, Chas. E. Oakes, P. H. Powers, O. Titus, J. T. Ward.

EDISON ELECTRIC INSTITUTE OFFICERS AND COMMITTEES

(Continued)

ADVISORY COMMITTEE 1949-1950

D. C. BARNES.....Virginia Electric & Power Co., Charlottesville, Va.
E. F. BARRETT..Long Island Lighting Co., Mineola, N. Y.
S. R. BERTRON.....Houston Lighting & Power Co., Houston, Tex.
J. B. BLACK.....Pacific Gas and Electric Co., San Francisco, Calif.
GEORGE H. BLAKE....Public Service Electric & Gas Co., Newark, N. J.
B. F. BRAHENEY.....Northern States Power Co., Minneapolis, Minn.
PRENTISS BROWN..The Detroit Edison, Co., Detroit, Mich.
CURTIS E. CALDER.....Electric Bond & Share Co., New York, N. Y.
J. W. CARPENTER..Texas Power & Light Co., Dallas, Tex.
H. P. LIVERSIDGE.....,.....Philadelphia Electric Co. Philadelphia, Pa.
EARLE J. MACHOLD.....Niagara Mohawk Power Corp., Syracuse, N. Y.
T. W. MARTIN...Alabama Power Co., Birmingham, Ala.
J. W. MCAFEE.....Union Electric Co. of Missouri, St. Louis, Mo.
W. C. MULLENDORE....Southern California Edison Co., Los Angeles, Calif.
A. B. PATERSON.....New Orleans Public Service Inc., New Orleans, La.
W. H. SAMMIS.....Ohio Edison Co., Akron, Ohio
WILLIAM SCHMIDT, JR., Consolidated Gas Electric Light & Power Co., Baltimore, Md.
PHILIP SPORN...American Gas and Electric Service Corp., New York, N. Y.
A. H. KEHOE....Consolidated Edison Co. of N. Y. Inc., New York, N. Y.
E. S. THOMPSON.....The West Penn Electric Co., New York, N. Y.
J. V. TONER.....Boston Edison Co., Boston, Mass.
J. R. WHITING....Consumers Power Co., Jackson, Mich.
E. A. YATES.....The Southern Co., New York, N. Y.

CHAIRMEN OF EDISON ELECTRIC INSTITUTE COMMITTEES (1949-1950)

ACCOUNTING

Accounting Division Executive, W. H. ZIMMER.....The Cincinnati Gas & Electric Co., Cincinnati, Ohio
Application of Accounting Principles, H. H. SCAFF.....Ebasco Services Inc., New York, N. Y.
Customer Activities, J. D. ELLIOTT.....The Detroit Edison Co. Detroit, Mich.
Depreciation Accounting, A. E. BAUHAN.....Public Service Electric & Gas Co., Newark, N. J.
General Accounting, H. S. KING.....Commonwealth Services Inc., New York, N. Y.
Plant Accounting and Records, F. E. DRAPALIK.....Union Electric Co. of Missouri, St. Louis, Mo.
Taxation, C. J. TRUDEAU.....Wisconsin Electric Power Co., Milwaukee, Wis.

COMMERCIAL

Commercial Division General, HARRY RESTOFSKI.....West Penn Power Co., Pittsburgh, Pa.
Sales Personnel and Training, E. O. GEORGE.....The Detroit Edison Co., Detroit, Mich.
Wiring and Specifications, F. E. DAVIS.....Commonwealth Services Inc., Jackson, Mich.
Commercial Sales Section, C. A. STEVENS.....Public Service Electric & Gas Co., Newark, N. J.
Farm Section, J. C. CAHILL.....The Detroit Edison Co., Detroit, Mich.
Industrial Power and Heating Section, R. G. ELY.....Public Service Electric & Gas Co., Newark, N. J.
Residential Section, H. A. STROUD.....Monongahela Power Co., Fairmont, W. Va.

ENGINEERING

Engineering Division General, E. W. DILLARD.....New England Power Service Co., Boston, Mass.
Electrical Equipment, B. VAN NESS, JR.....Pennsylvania Water & Power Co., Baltimore, Md.
Hydraulic Power, G. J. VENCILL.....Union Electric Co. of Missouri, St. Louis, Mo.
Meter and Service, H. A. BROWN.....Rochester Gas & Electric Corp., Rochester, N. Y.
Prime Movers, F. P. FAIRCHILD.....Public Service Electric & Gas Co., Newark, N. J.
Transmission and Distribution, J. E. MCCORMACK.....Consolidated Edison Co. of New York, Inc., New York, N. Y.

GENERAL

Accident Prevention, W. T. ROGERS.....Ebasco Services Inc., New York, N. Y.
Codes and Standards, J. T. BARRON.....Public Service Electric & Gas Co., Newark, N. J.
Electric Power Survey, WALKER L. CISLER.....The Detroit Edison Co., Detroit, Mich.
Financing and Investor Relations, C. E. OAKES.....Pennsylvania Power & Light Co., Allentown, Pa.
Industrial Relations, S. F. LEAHY.....The Detroit Edison Co., Detroit, Mich.
Insurance, I. M. CARPENTER.....Ebasco Services Inc., New York, N. Y.
Membership, E. S. THOMPSON.....The West Penn Electric Co., Inc., New York, N. Y.
Prize Awards, G. E. WHITWELL.....Philadelphia Electric Co., Philadelphia, Pa.
Purchasing and Stores, R. P. SNOW.....The Cleveland Electric Illuminating Co., Cleveland, Ohio
Rate Research, S. W. ANDREWS.....American Gas & Electric Service Corp., New York, N. Y.
Rural and Urban Development, GEORGE R. KEEGAN.....Western Massachusetts Electric Co., Springfield, Mass.
Statistical, O. E. SMITH.....Consolidated Gas Electric Light & Power Co., Baltimore, Md.
Transportation, LINN EDSALL.....Philadelphia Electric Co., Philadelphia, Pa.

Missouri,
Louis, Mo.
dison Co.,
eles, Calif.
ervice Inc.,
rleans, La.
kron, Ohio

Power Co.,
nore, Md.
vice Corp.,
ork, N. Y.
N. Y. Inc.,
ork, N. Y.
ectric Co.,
ork, N. Y.
ton, Mass.
son, Mich.
ork, N. Y.

nnati, Ohio
York, N. Y.
roit, Mich.
vark, N. J.
ork, N. Y.
Louis, Mo.
ukee, Wis.

sburgh, Pa.
roit, Mich.
son, Mich.
vark, N. J.
roit, Mich.
vark, N. J.
nt, W. Va.

ston, Mass.
imore, Md.
Louis, Mo.
ster, N. Y.
vark, N. J.
York, N. Y.

York, N. Y.
vark, N. J.
roit, Mich.
ntown, Pa.
roit, Mich.
York, N. Y.
York, N. Y.
delphia, Pa.
eland, Ohio
York, N. Y.
field, Mass.
imore, Md.
delphia, Pa.